NASA SP-7011 (147)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY

WITH INDEXES

(Supplement 147)

NOVEMBER 1975

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

STAR (N-10000 Series)	N75-28003—N75-29995
IAA (A-10000 Series)	A75-38854—A75-41898

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7011 (147)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 147)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in October 1975 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA)*

Scientific and Technical Information Office NOVEMBER 1975
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161 for $4 00 For copies mailed to addresses outside the United States, add $2 50 per copy for handling and postage

INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 253 reports, articles and other documents announced during October 1975 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)* The first issue of the bibliography was published in July 1964, since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space References describing similar effects of biological organisms of lower order are also included Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract The listing of the entries is arranged in two major sections *IAA Entries* and *STAR Entries*, in that order The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes—subject and personal author—are included

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1975 Supplements

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A75-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc (AIAA), as follows Paper copies are available at $5 00 per document up to a maximum of 20 pages The charge for each additional page is 25 cents Microfiche[1] are available at the rate of $1 50 per microfiche for documents identified by the '#' symbol following the accession number A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library Minimum airmail postage to foreign countries is $1 00 Please refer to the accession number, e g (A75-10763), when requesting publications

STAR ENTRIES (N75-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation The most commonly indicated sources and their acronyms or abbreviations are listed below If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line

Avail NTIS Sold by the National Technical Information Service to U S customers at the price shown in the citation following the letters HC (hard, paper, or facsimile copy) Customers outside the U S should add $2 50 per copy for handling and postage charges to the price shown (Prices shown in earlier *STAR* volumes, 1962-1974, have been superseded but may be calculated from the number of pages shown in the citation The price schedule by page count was given in the last *STAR* issue of 1974 or may be obtained from NTIS)

Microfiche[1] are available at a standard price of $2 25 (plus $1 50 for non-U S customers) regardless of age for those accessions followed by a "#" symbol Accession numbers followed by a "+" sign are not available as microfiche because of size or reproducibility

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Unit

NOTE ON ORDERING DOCUMENTS When ordering NASA publications (those followed by the "*" symbol), use the N accession number

NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number

Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation not by the N accession number It is also advisable to cite the title and other bibliographic identification

Avail SOD (or GPO) Sold by the Superintendent of Documents, U S Government Printing Office, in hard copy The current price and order number are given following the availability line (NTIS will fill microfiche requests, at the standard $2 25 price, for those documents identified by a "#" symbol)

(1) A microfiche is a transparent sheet of film 105 by 148mm in size containing as many as 60 to 98 pages of information reduced to micro images (Not to exceed 26 1 reduction)

Avail NASA Public Document Rooms Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave , S W , Washington, D C 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory

Avail ERDA Depository Libraries Organizations in U S cities and abroad that maintain collections of Energy Research and Development Administration reports, usually in microfiche form, are listed in *Nuclear Science Abstracts* Services available from the ERDA and its depositories are described in a booklet, *Science Information Available from the Energy Research and Development Administration* (TID-4550), which may be obtained without charge from the ERDA Technical Information Center

Avail Univ Microfilms Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) at $10 00 each and microfilm at $4 00 each regardless of the length of the manuscript Handling and shipping charges are additional All requests should cite the author and the Order Number as they appear in the citation

Avail USGS Originals of many reports from the U S Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this Introduction The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction

Avail HMSO Publications of Her Majesty's Stationery Office are sold in the U S by Pendragon House, Inc (PHI), Redwood City, California The U S price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI

Avail BLL (formerly NLL) British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England Photocopies available from this organization at the price shown (If none is given, inquiry should be addressed to the BLL)

Avail ZLDI Sold by the Zentralstelle fur Luftfahrtdokumentation und -Information, Munich, Federal Republic of Germany, at the price shown in deutschmarks (DM)

Avail Issuing Activity, or Corporate Author, or no indication of availability Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document

Avail U S Patent Office Sold by Commissioner of Patents, U S Patent Office, at the standard price of 50 cents each, postage free

Other availabilities If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS) The annual subscription rate for the monthly supplements, excluding the annual cumulative index, is $18 75 domestic $23 50 foreign All questions relating to the subscriptions should be referred to NTIS.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
750 Third Ave
New York, N Y 10017

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents
U S Patent Office
Washington, D C 20231

Energy Research and Development
Administration
Technical Information Center
P O Box 62
Oak Ridge, Tennessee 37830

ESA - Space Documentation Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome), Italy

Her Majesty's Stationery Office
P O Box 569, S E 1
London, England

NASA Scientific and Technical Information
Facility
P O Box 8757
B W I Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Office (KSI)
Washington, D C 20546

National Technical Information Service
Springfield, Virginia 22161

Pendragon House, Inc
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U S Government Printing Office
Washington, D C 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd
Tylers Green
London, England

U.S Geological Survey
1033 General Services Administration Bldg
Washington, D C 20242

U S Geological Survey
601 E Cedar Avenue
Flagstaff, Arizona 86002

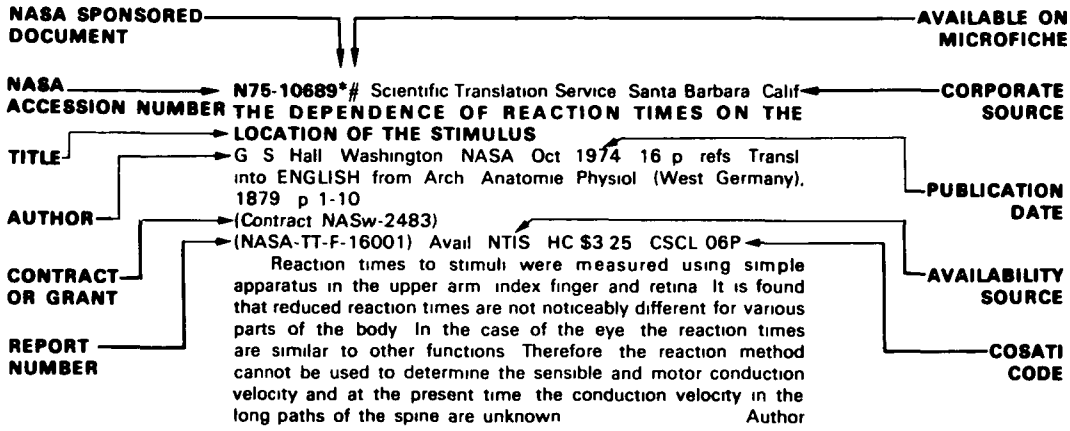
U S Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U S Geological Survey
Bldg 25, Denver Federal Center
Denver, Colorado 80225

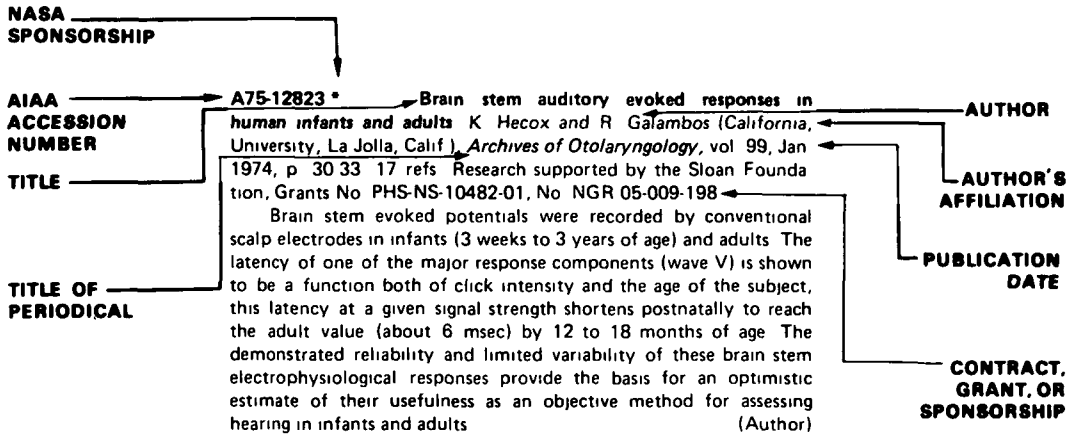
Zentralstelle fur Luftfahrtdoku-
mentation und -Information
8 Munchen 86
Postfach 880
Federal Republic of Germany

TABLE OF CONTENTS

TYPICAL CITATION AND ABSTRACT FROM *STAR*



TYPICAL CITATION AND ABSTRACT FROM *IAA*



AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 147) **NOVEMBER 1975**

IAA ENTRIES

A75-38997 * Effect of parathyroidectomy on bone growth and composition in the young rat L C Keil, J A Prinz (NASA, Ames Research Center, Moffett Field, Calif), and J. W Evans (NASA, Ames Research Center, Moffett Field, California, University, Davis, Calif) *Growth*, vol 38, 1974, p 519-527 9 refs

In an effort to determine the influence of the parathyroids on bone growth and composition, 28-day-old male Sprague-Dawley rats were sacrificed 28, 56, and 84 days after parathyroidectomy or sham parathyroidectomy Body growth as well as femur growth were retarded following parathyroidectomy Hypocalcemia and hyperphosphatemia occurred in all parathyroidectomized rats, no alterations in plasma magnesium levels were noted Femur magnesium was increased by 22-30% in the parathyroidectomized rats whereas femur calcium remained unchanged Bone phosphorus was increased 56 and 84 days following parathyroidectomy Results of this study indicate that parathyroidectomy retards growth while increasing bone magnesium and phosphorus content (Author)

A75-38998 * A fine structural study of degenerative changes in the dorsal column nuclei of aging mice - Lack of protection by vitamin E J E Johnson, Jr , W R Mehler, and J Miquel (NASA, Ames Research Center, Neurosciences Branch, Moffett Field, Calif) *Journal of Gerontology*, vol 30, no 4, 1975, p 395-411 46 refs NASA Task 970-21-11-11, NASA Task 970-21-63-06

A75-39061 * Optimal control of multiplicative control systems arising from cancer therapy K Bahrami (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif) and M Kim (Cornell University, Ithaca, N Y) *IEEE Transactions on Automatic Control*, vol AC-20, Aug 1975, p 537-542 22 refs

This study deals with ways of curtailing the rapid growth of cancer cell populations The performance functional that measures the size of the population at the terminal time as well as the control effort is devised With use of the discrete maximum principle, the Hamiltonian for this problem is determined and the condition for optimal solutions are developed The optimal strategy is shown to be a bang-bang control It is shown that the optimal control for this problem must be on the vertices of an N-dimensional cube contained in the N-dimensional Euclidean space An algorithm for obtaining a local minimum of the performance function in an orderly fashion is developed. Application of the algorithm to the design of antitumor drug and X-irradiation schedule is discussed (Author)

A75-39151 Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Symposium supported by the U S Navy Edited by P Lomax (California, University, Los Angeles, Calif), E Schonbaum, and J Jacob (Institut Pasteur, Paris, France) Basel, S Karger AG, 1975 426 p $54 50

Studies are described concerning the relationship between temperature regulation in homeothermic animals and certain biogenic and synthetic chemical agents, particularly neurotransmitters. Topics discussed include neural models on temperature regulation for cold-stressed animals, observations on the development of the 'fever' mechanism in the fetus and newborn, dopaminergic mechanisms in drug-induced temperature effects, physiological and biochemical characteristics of adrenergic receptors and pathways in brown adipocytes, the role of catecholamines in cold-induced thermogenesis in the newborn pig, the effects of meperidine and dextromethorphan on thermoregulation in mice, and a comparison of the effects of ricin- and diathermy-induced hyperthermia on cardiorespiratory actions of chloroquine

S.J M.

A75-39152 * Neural models on temperature regulation for cold-stressed animals J M Horowitz (California, University, Davis, Calif) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 1-10 30 refs Grant No NGR-05-004-035

The present review evaluates several assumptions common to a variety of current models for thermoregulation in cold-stressed animals Three areas covered by the models are discussed signals to and from the central nervous system (CNS), portions of the CNS involved, and the arrangement of neurons within networks Assumptions in each of these categories are considered The evaluation of the models is based on the experimental foundations of the assumptions. Regions of the nervous system concerned here include the hypothalamus, the skin, the spinal cord, the hippocampus, and the septal area of the brain S J M

A75-39153 Physical models of human thermoregulation Y. Houdas and J -D Guieu (Lille II, Université, Lille, France). In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 11-21 32 refs

Two models of thermal regulation are examined a passive system in which the thermal controller is considered as a servomechanism, and an active system in which the thermal controller is considered as a regulator The first of these systems is concluded to be the more accurate. The conceptual difference between the two is that a regulator maintains a constant controlled output, while a servomechanism causes the output to follow a varying input. Fever could be explained by a change in the gain of the controller in the case of the servomechanism model, while in the case of the regulator model it could be explained by the variation of a set point or a change in controller gain S J.M.

A75-39154 The thalamus and thermoregulation J N Hayward (California, University, Los Angeles, Calif) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 22 31 33 refs Grant No PHS-NS-10129

Some recent evidence is presented suggesting that the thalamus may play an important role in certain thermoregulatory responses rooted in behavior (as opposed to responses rooted in physiology) The ventrobasal (VB) nuclear complex of the thalamus and the intralaminar nuclear group of the thalamus are integral in the

evidence VB thalamic neurons change their background unstimulated activity in response to the level of arousal, faster during waking and slower during slow-wave sleep, in a manner similar to previously studied midline thalamic and hypothalamic neurons In contrast, cells in the intralaminar thalamic nuclear group, CM and CL, respond to thermal stimuli in dissociation from sleep-waking behavior and possibly in relation to thermoregulatory 'behavior'
S J M

A75-39155 An integrative model of monoamine and ionic mechanisms in the hypothalamic control of body temperature R D Myers (Purdue University, Lafayette, Ind) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 32-42 46 refs

An integrated view of the current status of some of the major neurochemical mechanisms proposed for the control of body temperature is presented Each of the theoretical viewpoints is based on 3 experimental restrictions firstly, the species of laboratory animal has been the cat and the primate, mainly because of the size of the brain in both cases and the relative phylogenetic closeness of the monkey to man, secondly, the morphological emphasis thus far has centered on the diencephalon and mesencephalon, thirdly, the analytical details of each mechanism have been accumulated by the investigation of individual anatomical sites in the brainstem rather than through the intraventricular or systemic approaches which are less specific (Author)

A75-39156 Histamine and temperature regulation P Lomax and M D Green (California, University, Los Angeles, Calif) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 . Basel, S Karger AG, 1975, p 85-94 31 refs Grant No PHS-GM-02040

Studies are reviewed which suggest that histamine may be a central neurotransmitter The studies concern (1) systemic administration of histamine and body temperature and (2) brain histamine and temperature regulation Present evidence, however, does not provide sufficiently firm grounds for assigning a specific neurophysiological function to this amine, whether histaminergic neurons represent long pathways in afferent thermoregulatory input or are merely nonspecific interneurons remains to be determined S J M

A75-39157 Studies on central noradrenergic pathways in the control of body temperature P J Lewis, M D Rawlins, and J L Reid (London, Royal Postgraduate Medical School, London, Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 111-118 24 refs

Two aspects of the central noradrenergic control of body temperature are discussed endogenous brain noradrenaline as a mediator of temperature responses in mimicry of the action of exogenous amine, and the properties of the central adrenoceptors involved in thermoregulation The studies outlined suggest that endogenous noradrenaline can influence body temperature, although the precise role of noradrenergic neurones in thermoregulation is not indicated In addition, results show that although the central thermoregulatory adrenoceptors have some properties in common with peripheral alpha-adrenoceptors, they may not be identical
S J M

A75-39158 Amine-prostaglandin modulation of activity of thermoregulatory neurones R M Jell (Manitoba, University, Winnipeg, Canada) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 119-123 7 refs Research supported by the Medical Research Council of Canada and University of Manitoba

Experimental results are reported showing that the amine responses of thermosensitive neurons are unpredictable, and that prostaglandins (PGE-1 and PGE-2) are likely to mediate in thermoregulation, i e , that amines (such as ACh, NA, and 5-HT) probably exert their effect on intermediary neurons, which in turn release PG This theory is supported by the finding that almost all neurons responding to PGE-1 and -2 are also thermosensitive, while most neurons that do not respond to PGE-1 and -2 are not thermosensitive
S J M

A75-39159 * Physiological and biochemical characteristics of adrenergic receptors and pathways in brown adipocytes B A Horwitz (California, University, Davis, Calif) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 150-158 24 refs NSF Grant No GB-30594, Grant No NGR-05-004-035

Mechanisms involved in the thermogenic response of brown adipose tissue (BAT) to sympathetic nervous stimulation (e g , by cold exposure) and to norepinephrine (NE) release are investigated Three effects appear to play a role in the increased oxygen consumption (and heat production) of the adipocytes increased membrane permeability, activation of the beta-adrenergic pathway, and enhancement of Na(+)/K(+) membrane pump activity Increased passive influx of Na(+) and efflux of K(+) due to greater permeability raise the energy demands of the Na/K pump, the pump is also stimulated by increased cyclic AMP synthesis resulting from activation by NE of membrane-bound adenyl cyclase Studies with inhibitors such as propanolol, phentolamine, and ouabain support this hypothesis
S J M

A75-39160 Brown adipose tissue and the calorigenic response to norepinephrine in cold-acclimated rats M C Laury and R Portet (Collège de France, Paris, France) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 172-179 19 refs

A75-39161 Noradrenaline content and fat mobilization on brown adipose tissue of the rat after forced swimming M Beauvallet, R Portet, and M Solier (Institut de Pharmacologie et Adaptation Energétique a l'Environnment, Paris, France) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 180-185 13 refs

A75-39162 Ability of young, adult and aged rats to adapt to different ambient temperatures. H Rommelspacher, G W Schulze, and V Bolt (Berlin, Freie Universitat, Berlin, West Germany) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 192-201 11 refs Research supported by the Deutsche Forschungsgemeinschaft

Certain data from previous investigations on concentrations of putative neurotransmitters in the hypothalamus are discussed, together with peripheral mechanisms which play a role in maintaining body temperature Specific areas covered comprise evaporative heat loss as an example of peripheral heat loss, nonshivering thermogenesis as an example of heat production, and the respiratory quotient as a measure of energy-producing processes S J M

A75-39163 Effects on cardiac tissue of serum derivatives from hibernators A R Dawe (U S Navy, Office of Naval Research, Chicago, Ill) and W A Spurrier (Loyola University, Maywood, Ill) In Temperature regulation and drug action, Proceedings of the

Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 209-217 6 refs Grant No NIH-HE-08682

This paper outlines a new approach to the study of the hibernating heart Specifically, it provides the background rationale for administration of a dialysate from the blood serum of a hibernating animal in order to assess whether the dialysate can induce 'tissue hibernation' in the heart (at the organ level) In view of the fact that we do not know the exact biochemical nature of the 'trigger', at this stage, positive results could only be interpreted as indicating that the dialysate of the serum of a hibernating animal not only contains a factor which will induce hibernation out of season in an active animal which ordinarily hibernates, but also that this dialysate carries a factor which produces electrical or mechanical changes in the heart which renders it able to undergo hibernation. (Author)

A75-39164 Effects of ethanol, barbiturates, phenothiazines and biogenic amines on man during exposure to cold J Hirvonen (Oulu, University, Oulu, Finland) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 252-256 18 refs

Previous findings on the hypothermogenic and cold-exposure-protective effects of ethanol, barbiturates, phenothiazines, biogenic amine excretion, and extensive burns are reviewed Cutaneous vasodilation is the primary pathway for alcohol-induced susceptibility to hypothermia upon exposure to low ambient temperatures Barbiturates have been observed to exert a marked protective effect against extreme (freezing-range) cold by acting as sedatives and central muscle relaxants, thus preventing shivering and exhaustion Phenothiazines act synergesically with barbiturates in inducing hypothermia susceptibility. Excretion of catecholamines during severe exposure lowers body temperature, since the amines are potent calorigenic agents via their enhancement of lipolysis Evaporation of water and radiation of heat cause hypothermia in patients with extensive burns S J M

A75-39165 Chlorinated hydrocarbons as pharmacological tools in studies on thermoregulation. G M Ling, P D Hrdina, and R L Singhal (Ottawa, University, Ottawa, Canada) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 257-265 28 refs Research supported by the National Health Grants Program of Canada and Ontario Mental Health Foundation

Results of studies on the effects of chlorinated hydrocarbons such as DDT and chlordane administered to rats are presented This administration produces marked alterations in body temperature and in the concentrations of brainstem norepinephrine (NE) and 5-hydroxy-indolacetic acid, as well as in striatal and cerebrocortical acetylcholine The use of specific inhibitors of NE and 5-hydroxytryptamine synthesis indicates a relationship between the insecticide-induced changes in body temperature and various brain biogenic amines S J M

A75-39166 Effect of ambient heat stress on body development of rats and survival of fatal heat stress by drug administration F G Sulman, S Dikstein, N Hirschmann, Y Kaplanski, Y Koch, I Nir, Y Pfeifer, E Superstine, E Tal, and C P Weller (Jerusalem, Hebrew University, Jerusalem, Israel) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S. Karger AG, 1975, p 339-347 10 refs Research supported by the Nessim David Gaon Fund

A75-39167 * Temperature responses to infusion of electrolytes during exercise J E Greenleaf, S Kozlowski, H Kaciuba-Uscilko, K Nazar, and Z Brzezinska (NASA, Ames Research Center, Moffett Field, Calif , Polish Academy of Sciences, Laboratory of Applied Physiology, Warsaw, Poland) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 352-360 26 refs

Past studies on the influence of various metal ions on heat regulation in mammals are reviewed, and results of a study on the effect of Na and citrate in isotonic and hypertonic concentrations on temperature elevation during exercise in dogs are presented Hypertonic administration of Na before or during treadmill running and dosis of citrate during treadmill running significantly raised core temperature over controls and isotonic cases Thus the higher the plasma Na-osmotic concentration, the greater the inhibition of heat dissipation S J M

A75-39168 * The effect of thyroxine on temperature regulation during physical exercise in dogs S Kozlowski, H Kaciuba-Uscilko, J E Greenleaf, and Z Brzezinska (Polish Academy of Sciences, Laboratory of Applied Physiology, Warsaw, Poland, NASA, Ames Research Center, Moffett Field, Calif) In Temperature regulation and drug action, Proceedings of the Second Symposium on the Pharmacology of Thermoregulation, Paris, France, April 16-18, 1974 Basel, S Karger AG, 1975, p 361 366 12 refs

A75-39187 * Loudness enhancement - Monaural, binaural, and dichotic R Elmasian and R Galambos (California, University, La Jolla, Calif) *Acoustical Society of America, Journal,* vol 58, July 1975, p 229-234 18 refs NSF Grant No GB-32235, Grants No PHS-NS-07454, No PHS-NS-10482, No PHS-RR-07011, No NGR-05-009-198

When one tone burst (T) precedes another (S) by 100 msec, variations in the intensity of T systematically influence the loudness of S When T is more intense than S, S is increased, and when T is less intense, S loudness is decreased -This occurs in monaural, binaural, and dichotic paradigms of signal presentation When T and S are presented to the same ear (monaural or binaural), there is more enhancement with less intersubject variability than when they are presented to different ears (dichotic paradigm) Monaural enhancements as large as 30 dB can readily be demonstrated, but decrements rarely exceed 5 dB Possible physiological mechanisms are discussed for this loudness enhancement, which apparently shares certain characteristics with time-order error, assimilation, and temporal partial masking experiments (Author)

A75-39199 Pulse doppler ultrasound angiography for imaging arterial sections. A R Klumpp (Charles Stark Draper Laboratory, Inc , Cambridge, Mass), J H Dennis (Lowell Technological Institute, Lowell, Mass), S H Maslak (MIT, Cambridge, Mass), and G S Myers (Massachusetts General Hospital, Boston, Mass) In NEREM 74, Northeast Electronics Research and Engineering Meeting, Boston, Mass , October 28-31, 1974, Record Part 1 Newton, Mass , Institute of Electrical and Electronics Engineers, Inc , 1974, p 77-79 Research supported by the Monell and Vetlesen Foundations, Grant No NIH-14209

The paper describes principles and current practice of imaging cross sections and longitudinal sections of peripheral blood vessels by using Doppler ultrasound A range-gated pulse Doppler ultrasound system is described Instrumentation includes a piezoelectric transducer, sensor subsystem, Doppler threshold detector, and an analog computer P T H

A75-39301 Inverse assimilation - Was the hydrogen escape from the earth's primary atmosphere enhanced by H2-evolution coupled with biophoto-oxidation of methane P Decker (Hannover, Tierarztliche Hochschule, Hanover, West Germany) *(European Geophysical Society, Symposium on Trace Substances in the Atmosphere from Source to Sink, Trieste, Italy, Sept 23-24, 1974) Pure*

and Applied Geophysics, vol 112, no 6, 1974, p 865-875 30 refs

An inverse assimilation and dissimilation mechanism for early earth life is proposed in lieu of the present reductive photosynthesis reaction In the suggested scheme, CO2 and O2 would be energy-rich substances in the CH4-abundant (up to 7 bar), reductive atmosphere, they would be quickly depleted, and there would be no thermodynamic storage advantage (and insufficient substrate) for a photoreductive carbon cycle with them But a photooxidative conversion of CH4 into H2 and biomass - i e , C(H2O), by water would not only be more energetically feasible (requiring only 32 kcal/mole of light and successfully storing the energy), it would account for the high rate of H2 escape from the earth by biogenically producing a high atmospheric H2 pressure Dissimilation under this plan would involve reduction of C(H2O) by ample atmospheric H2 to regenerate CH4 and H2O S J M

A75-39309 **Detection of one-, two-, and three-dimensional Markov constraints in visual displays II - Multistate displays** I Pollack (Michigan, University, Ann Arbor, Mich) *Acta Psychologica,* vol 39, Aug 1975, p 251-261 NSF-supported research

The study of the depth of visual information processing is here extended to multistate displays Two classes of variables are distinguished display variables which may either be fixed at a single level or varied over its possible levels, e g , a numeric character, its brightness, and its orientation, and spatial-temporal variables which assume all possible states within each display, e g , the x- and y-coordinates of the display, and the time-coordinate, t, representing successive frames of the display Information was encoded in terms of constraints upon combinations of variables Excellent discrimination is achieved for detecting constraints among two, but not three, display variables, or for detecting constraints among one, but not two, display variables and up to three spatial-temporal variables Comparisons are made with previous tests of the depth of visual information processing with binary-coded materials within the spatial-temporal microstructure of the display (Author)

A75-39310 **High order sequential effects and the negative gradient of the relationship between simple reaction-time and foreperiod duration** C A Possamai, M Granjon, G Reynard, and J Requin (CNRS, Département de Psychophysiologie Générale, Marseille, France) *Acta Psychologica,* vol 39, Aug 1975, p 263-270 29 refs

A75-39311 **Retinal painting and visual information storage** G Stanley and M Molloy (Melbourne, University, Parkville, Victoria, Australia) *Acta Psychologica,* vol 39, Aug 1975, p 283-288 11 refs Australian Research Grants Committee Grant No A67/16441

As a measure of visual information storage (VIS), Haber and Nathanson (1968) have used a retinal painting task involving passing a narrow slit across a drawing which the S has to see as a single percept Two experiments were conducted to evaluate this task as a measure of VIS In experiment 1 it was shown that contrary to other measures of VIS, adults have longer values than children In experiment 2 dyslexic and control children performed at equivalent levels on this task It is suggested that retinal painting involves a different persistence effect to that normally used as a measure of VIS (Author)

A75-39312 **Warm-up effects in the learning of discrete motor skills** C A Wrisberg, A W Salmoni, and R A Schmidt (Michigan, University, Ann Arbor, Mich) *Acta Psychologica,* vol 39, Aug 1975, p 311-320 8 refs

Three experiments were conducted to determine the influence of warming-up activities on performance and on learning in two discrete motor tasks During initial trials on the criterion task, Ss were given various types of warming-up activities having an activity-set that was either the same as or different from the criterion task Test trials followed in which all groups practiced the criterion task only No significant differences in performance on the criterion task were found regardless of the appropriateness of the warming-up activity during initial trials The results suggested that warming-up properties are not a factor in original learning of discrete motor skills (Author)

A75-39332 **Blood and CSF acid-base changes, and rate of ventilatory acclimatization of awake dogs to 3,550 m** M Bureau and P Bouverot (CNRS, Laboratoire de Physiologie Respiratoire, Strasbourg, France) *Respiration Physiology,* vol 24, July 1975, p 203-216 28 refs

A75-39358 * **Release of volatile mercury from vascular plants** S M Siegel, N J Puerner, and T W Speitel (Hawaii, University, Honolulu, Hawaii) *Physiologia Plantarum,* vol 32, 1974, p 174-176 8 refs Grant No NGL-12-001-042

Volatile, organic solvent soluble mercury has been found in leaves and seeds of several angiosperms Leaves of garlic vine, avocado, and haole-koa release mercury in volatile form rapidly at room temperature In garlic vine, the most active release is temperature dependent, but does not parallel the vapor-pressure temperature relationship for mercury Mercury can be trapped in nitric-perchloric acid digestion fluid, or n-hexane, but is lost from the hexane unless the acid mixture is present Seeds of haole-koa also contain extractable mercury but volatility declines in the series n-hexane (90%), methanol (50%), water (10%) This suggests that reduced volatility may accompany solvolysis in the more polar media (Author)

A75-39361 * **Nuclear-cytoplasmic interactions in amoeba interspecific hybrids** S Chatterjee (Bhabha Atomic Research Centre, Modular Laboratories, Bombay, India) and M V N Rao (New York, State University, Buffalo, N Y) *Experimental Cell Research,* vol 84, 1974, p 235-238 15 refs Grant No NGR-33-015-002

A75-39362 * **Regulation of nuclear DNA synthesis in Amoeba interspecific hybrids** M V N Rao and S Chatterjee (Bhabha Atomic Research Centre, Modular Laboratories, Bombay, India) *Experimental Cell Research,* vol 88, 1974, p 371-374 18 refs Grant No NGR-33-015-002

A75-39366 * **The acute inhalation toxicity in rats from the pyrolysis products of four fluoropolymers** V L Carter, Jr , D A Bafus, H P Warrington, and E S Harris (NASA, Johnson Space Center, Incorporated Toxicology Laboratory, Houston, Tex) *Toxicology and Applied Pharmacology,* vol 30, 1974, p 369-376 9 refs

A75-39372 * **Neurophysiological approaches to the study of aggression** A A Perachio and M Alexander (Emory University, Atlanta, Ga) In Neuropsychology of aggression New York, Plenum Publishing Corp , 1974, p 65-84, Discussion, p 85, 86 27 refs Grants No NIH-RR-00165, No NIH-NS-09688, No NGR-11-001-045

A75-39375 * **The radiobiological implications of statistical variations in energy deposition by ionizing radiations** N A Baily and J E Steigerwalt (California, University, La Jolla, Calif) In Advances in radiation biology Volume 5 Edited by J T Lett New York, Academic Press, Inc , 1975, p 1-45 59 refs Grant No NGL-05-009-103

Traditional approaches to microdosimetry, the fundamental physics of energy deposition, the importance of statistical processes, an illustration of possible radiobiological interpretation, and modeling based on microdosimetric concepts are discussed Emphasis is on the inadequacies in linear energy transfer (LET) theory For many reasons, concepts based on averaging may not be applicable to

ionizing radiation absorption by and damage to small biological targets S J M

A75-39423 **Visual sensations induced by Cerenkov radiation** P J McNulty, V P Pease (Clarkson College of Technology, Potsdam, N Y), and V P Bond (Brookhaven National Laboratory, Upton, N Y) *Science,* vol 189, Aug 8, 1975, p 453, 454 16 refs AEC-sponsored research

Pulses of relativistic singly charged particles entering the eyeball induce a variety of visual phenomena by means of Cerenkov radiation generated during their passage through the vitreous These phenomena are similar in appearance to many of the visual sensations experienced by Apollo astronauts exposed to the cosmic rays in deep space (Author)

A75-39535 # **The United States Naval Test Pilot School** R. A Johnson (U S Naval Test Pilot School, Patuxent River, Md) *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, Los Angeles, Calif , Aug 4-7, 1975, Paper 75-1048* 7 p

Information concerning the United States Naval Test Pilot School, its academic curriculum and flight syllabus including the school aircraft and their uses are discussed The student spends half of each working day in the classroom studying aero-thermodynamics, dynamic and static stability, aircraft and engine performance, and other related aeronautical engineering subjects A complete list of courses is presented The remainder of the day is devoted to the flight phase and includes planning, flying, and writing reports of test flights in a complete spectrum of aircraft Both fixed-wing and rotary-wing syllabi consist of approximately 65 flights including participation in appropriate flights in performance and flying qualities, comprehensive flight evaluations of radar, fire control, bombing, navigation, and ASW systems The selection of students, prerequisites for admission, and the flight test instrumentation are described M G

A75-39537 # **Major changes in flight crew training - 8 years of experience at American Airlines** T M. Melden and R C. Houston (American Airlines, Inc , Fort Worth, Tex) *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, Los Angeles, Calif , Aug 4-7, 1975, Paper 75-1049* 6 p

During the last eight years, over 5,000 pilots have completed Transition Training to B-747, DC-10, B-707, B-727 and BAC 1-11 aircraft at American Airlines' Flight Academy These pilots have completed over 25,000 Recurrent Training cycles All of these pilots have been trained in a manner that, initially, was revolutionary, yet the resulting product of trained crewmen, along with carefully prescribed and enforced operating procedures, has achieved the best safety record in commercial aviation These training techniques are described and illustrated Critical operating procedures that are just as vital to safety are discussed Training of flight crewmen can be more efficient and can also be of better quality A systems approach to planning the whole training program, including line experience, is vital The proper use of simulation is a key ingredient (Author)

A75-39821 **Future flight deck design** R E. Hillman (British Aircraft Corp , Ltd , Weybridge, Surrey, England) and J W Wilson (Hawker Siddeley Aviation, Ltd , Hatfield, Herts , England). *Aeronautical Journal,* vol 79, June 1975, p 235-238

Questions concerning the minimum size of the operating crew of a transport aircraft are considered, taking into account the functions of a third pilot In the absence of a third crew member, the pilots will have to carry out, in addition to their flight tasks, also a number of duties related to system management, documentation, and fault diagnosis and recording Future flight deck design must provide the operational environment which will make it possible for the pilots to attend to all their required functions Attention is given to equipment for minimizing the workload, flight deck layout constraints, and aspects of flight deck research G R

A75-39823 **The proper symbiosis of the human pilot and automatic flight control /Eighteenth Lanchester Memorial Lecture/.** K H Doetsch (Braunschweig, Technische Universitat, Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt, Braunschweig, West Germany). *Aeronautical Journal,* vol 79, June 1975, p 247-260 18 refs

The basic characteristics of the phugoid theory are discussed, giving attention to its importance in connection with the development of STOL with high lift. Aspects of short period oscillations and autostabilization related to the extension of the flight regime to higher speed and higher altitude are examined Problems related to human factors are considered along with the modern flight control concept and questions regarding the ideal form of cooperation between a future pilot and his aircraft control system. G.R.

A75-39825 * **Responses to preoptic temperature manipulation in the awake and hibernating marmot** F E South, W C Hartner, and R H Luecke (Missouri, University, Columbia, Mo) *American Journal of Physiology,* vol 229, July 1975, p 150-160 36 refs Research supported by the University of Missouri, Grant No NGR-26-004-025

Responses of normothermic and hibernating marmots to manipulations of the preoptic-hypothalamic temperature (T-PO) were experimentally investigated An exponential increase in open-loop gain (OLG) occurred with decreases in temperature, it is concluded that this response can be explained by recruitment of cold-sensitive neurons brought about by low-temperature inactivation of inhibitory neurons Marmots not only seek out the hibernating state, but also utilize all the thermoregulatory means they possess to remain in it for a given period of time S J M

A75-39975 **Visual form perception** K H Ruddock (Imperial College of Science and Technology, London, England) *Contemporary Physics,* vol 16, July 1975, p 317-348 84 refs

After a brief description of the anatomy and histology of the retina and central visual pathways, the electrical responses of visual neurons in the frog and the primate are examined It is concluded that vertebrate visual systems are organized into a large number of parallel, cross-connected channels with a relatively small number of serial stages In the primate, there are cortical neurons selectively tuned to line stimuli of specific width, orientation, and length and to the stereoscopic depth of the stimulus in the visual field The dependence of such responses on the nature of the visual stimuli experienced by the animal during early post-natal development establishes that there is a degree of self-organization in these visual systems S J M

A75-40124 * **Beta structures of alternating polypeptides and their possible prebiotic significance** A Brack and L E Orgel (Salk Institute for Biological Studies, San Diego, Calif) *Nature,* vol 256, July 31, 1975, p 383-387 19 refs NASA-NSF-supported research

A survey of the commonest amino acids formed in prebiotic conditions suggests that the earliest form of genetic coding may have specified polypeptides with a strong tendency to form stable beta-sheet structures Poly(Val-Lys), like other polypeptides in which hydrophobic and hydrophilic residues alternate, tends to form beta structures It is shown that bilayers with a hydrophobic interior and a hydrophilic exterior may be present in aqueous solution (Author)

A75-40130 **Evidence against narrow-band spatial frequency channels in human vision - The detectability of frequency modulated gratings** C F Stromeyer, III and S Klein (Stanford University, Stanford, Calif) *Vision Research,* vol 15, Aug-Sept 1975, p 899-910 28 refs

Experiments are described showing that a simple sinusoidal grating and a frequency-modulated sinusoidal grating of identical contrast are about equally detectable Thus narrow-band mechanisms cannot readily account for the results, but medium-band mechanisms

with a one-octave bandwidth may be compatible with data on the visibility of compound gratings S J.M

A75-40131 **Binocular fusion and spatial localization of vertical and horizontal gratings of different spatial frequency (Fusion binoculaire et localisation spatiale de mires verticales et horizontales de frequences spatiales differentes)** F Rigaudiere (Muséum National d'Histoire Naturelle, Paris, France) *Vision Research,* vol 15, Aug -Sept 1975, p 931-938 49 refs In French

An in-detail study of the depth effects generated by the fusion of two monocular images differing in spatial frequency was performed For one observer, a variation in depth perception with image spatial frequency and with the ratio between the two frequencies was found, both for fusion of two horizontal gratings and for fusion of two vertical gratings Some similarities and differences between this phenomenon and aniseikonia are outlined S J M

A75-40132 **Apparent size and contrast** R A Weale (London, University, London, England) *Vision Research,* vol 15, Aug -Sept 1975, p 949-955 23 refs

Measurements were made of the apparent size of a square as a function of its contrast at a constant mean luminance The parameters included field-size, mean luminance, and spectral composition The classical effect - a light target on a dark background appearing larger than a congruent target of equal but opposite maximum contrast - gives way at low contrasts to a new effect the darker target appears to be larger than the light one Masking and blurring of the target contours point to the involvement of edge detectors in the new but not necessarily in the classical effect Additional observations on a low-frequency square grating show that its apparent mark-space ratio varies with the exposure time The data also reveal a significant asymmetry in the sense that the eye distinguishes between light-dark and dark-light contrasts (Author)

A75-40133 **Illusory reversal of visual depth and movement during changes of contrast.** S M Anstis (Bristol, University, Bristol, England) and B J Rogers (St Andrews, University, St Andrews, Scotland) *Vision Research,* vol 15, Aug -Sept 1975, p 957-961 23 refs Science Research Council Grant No B/SR/48368

The visual system usually sees phi apparent movement when two similar pictures are exposed successively, and stereoscopic depth when the pictures are exposed one to each eye But when a picture was followed via a dissolve by its own photographic negative, overlapping but displaced, strong apparent movement was seen in the opposite direction to the image displacement ('reversed phi') When both eyes saw a positive picture, and one eye also saw an overlapping low-contrast negative containing binocular disparity, 'reversed stereo' was seen, with the apparent depth opposite to the physical disparity Results were explained with a model of spatial summation by visual receptive fields (Author)

A75-40134 **Effect of mean reaction time on saccadic responses to two-step stimuli with horizontal and vertical components** S G Lisberger, A F Fuchs, W M King, and L C Evinger (Washington, University, Seattle, Wash) *Vision Research,* vol 15, Aug -Sept 1975, p 1021-1025 6 refs Grants No NIH-RR-00166, No NIH-EY-00745, No NIH-GM-00260, No NIH-DE-00248, No NIH-GZ-3608

A75-40135 **Measuring perceived orientation** P Emerson, P Wenderoth, I Curthoys, and I Edmonds (Sydney, University, Sydney, Australia) *Vision Research,* vol 15, Aug -Sept 1975, p 1031-1033 10 refs

Results obtained previously by others with a dot alignment task have been taken to imply that a line is perceptually attracted to the nearest vertical or horizontal axis of space Angle matching experiments have been taken to imply the opposite This discrepancy could be attributable either to different tasks or to different displays, or both In five experiments, we replicated both previous findings and additional evidence indicated that the discrepancy is not display contingent, suggesting that at least one of the two methods does not measure perceived orientation (Author)

A75-40274 **Carbon dioxide response curves during hypothermia** A V Ruiz (Max-Planck-Institut fur Physiologische und Klinische Forschung, Bad Nauheim, West Germany) *Pflugers Archiv,* vol 358, no 2, 1975, p 125-133 33 refs

The responsiveness of the medullary chemoreceptors, measured by the ventilatory response to hypercapnia given in an hyperoxic gas mixture in intact anesthetized dogs, has been evaluated during normothermia and at two levels of hypothermia The ventilatory response to CO2 decreased while bood temperature was lowered until the response became absent during deep hypothermia For normothermia and both levels of hypothermia, a similar oxygen drive of ventilation was found which was equivalent to approximately one-fourth of the spontaneous ventilation It is suggested that in the deeply hypothermic animal, the normal respiratory drive is apparently of peripeheral (arterial) chemoreceptor origin When this drive is nullified or significantly decreased, gentle shivering could be responsible for stimulating the respiratory center (Author)

A75-40275 **Phase shift in the REM sleep rhythm** H Schulz, G Dirlich, and J Zulley (Max-Planck-Institut fur Psychiatrie, Munich, West Germany) *Pflugers Archiv,* vol 358, no 3, 1975, p 203-212 15 refs Deutsche Forschungsgemeinschaft Grant No. Le-193-9/10

The periodic alternation between REM and NREM sleep was analyzed Usually, sleep records of consecutive nights of a subject are regarded to be independent events However, it may be that consecutive nights are realizations of a continuously ongoing rhythm The temporal patterns of REM and NREM sleep in sequences of about 30 consecutive nights were analyzed The results show that only the onset of the first REM sleep phase during any one night may be predicted from the sleep onset time, whereas a systematic phase shift between consecutive nights was observed in the later REM sleep phases Thus, the onset of later REM sleep phases is better predicted by assuming a rhythm with stable period length which controls the appearance of REM sleep phases in successive nights Under the experimental conditions the phase shift was between 5 and 10 min per 24 hrs for the 3 subjects The result is accordance with Kleitman's basic rest activity cycle (BRAC) hypothesis (Author)

A75-40533 **Ocular tissue damage due to ultrashort 1060-nm light pulses from a mode-locked Nd glass laser** J Taboada and R W Ebbers (USAF, School of Aerospace Medicine, Brooks AFB, Tex) *Applied Optics,* vol 14, Aug 1975, p 1759-1761 14 refs

A75-40598 # **Optimal parameters for eliciting cardio-acceleration by electrical stimulation of the ventromedial hypothalamus** G Johansson, R Kalimo, T Paakkonen, and S Ruusunen (Helsinki, University, Helsinki, Finland) *Acta Physiologica Scandinavica,* vol 94, June 1975, p 189-197 30 refs Research supported by the National Research Council for Medical Sciences of Finland and Finnish Cultural Foundation

The ventromedial hypothalamus of the unrestrained cat was stimulated electrically through permanent electrodes The stimulation parameters, amplitude, duration and frequency of the square wave pulses were combined to produce a 20% increase of the resting heart rate value The charge per stimulation (10 s) varied from about 1 to 100 micro-coulombs, depending on the parametric combination used The relation among the stimulation parameters and the total amount of electric charge of the pulses was estimated by the correlation technique The results suggested that about 60% of the variation in the electric charge resulting in the constant response was due to the variation of the pulse repetition frequency The optimal parameters for eliciting cardio-acceleration in the cat by stimulation of the ventromedial hypothalamus seem to be pulse durations between 0 1 and 0 5 ms and pulse repetition frequencies below 100 P/s, with pulse amplitude as the dependent variable (Author)

A75-40599 **Detection of symmetry as a function of angular orientation** M C Corballis and C E Roldan (McGill University, Montreal, Canada) *Journal of Experimental Psychology*, vol 1, Aug 1975, p 221-230 21 refs Research supported by the National Research Council of Canada, Defence Research Board of Canada Grant No 9425-10

Subjects decided as quickly as possible whether dot patterns were or were not symmetrical about a line Their decision times were shortest when the line was vertical and increased as the angle between the line and the vertical increased This orientation function was essentially the same whether or not the subjects knew in advance what the orientation of the line would be When the subjects tilted their heads, the function shifted in the direction of the head tilt, indicating that it was tied more closely to retinal than to gravitational coordinates These data can be interpreted to mean that people mentally rotate patterns to a vertical orientation before judging their symmetry This in turn suggests that the 'template' for detecting symmetry may itself be embedded symmetrically in the brain (Author)

A75-40600 * **Decision-related cortical potentials during an auditory signal detection task with cued observation intervals** K C Squires, N K Squires, and S A Hillyard (California, University, La Jolla, Calif) *Journal of Experimental Psychology*, vol 1, Aug 1975, p 268-279 31 refs NASA supported research, Grant No NIH-1-R01-MH-25594-01

Cortical-evoked potentials were recorded from human subjects performing an auditory detection task with confidence rating responses Unlike earlier studies that used similar procedures, the observation interval during which the auditory signal could occur was clearly marked by a visual cue light By precisely defining the observation interval and, hence, synchronizing all perceptual decisions to the evoked potential averaging epoch, it was possible to demonstrate that high-confidence false alarms are accompanied by late-positive P3 components equivalent to those for equally confident hits Moreover the hit and false alarm evoked potentials were found to covary similarly with variations in confidence rating and to have similar amplitude distributions over the scalp In a second experiment, it was demonstrated that correct rejections can be associated with a P3 component larger than that for hits Thus it was possible to show, within the signal detection paradigm, how the two major factors of decision confidence and expectancy are reflected in the P3 component of the cortical-evoked potential (Author)

A75-40716 # **Electrical activity of dog's olfactory bulb and amygdala in paradoxical stage of sleep (Elektricheskie reaktsii oboniatel'nykh struktur i iader mindalevidnogo kompleksa mozga sobaki v paradoksal'noi faze sna).** B L Ganzha and P G Bogach (Kievskii Gosudarstvennyi Universitet, Kiev, Ukrainian SSR) *Neirofiziologiia*, vol 7, no 3, 1975, p 227-233 36 refs In Russian

Electrical activity of the olfactory bulb, olfactory tubercle, amygdala, hippocampus, hypothalamus and neocortex during physiological sleep was studied in chronic experiments in unanesthetized unrestrained dogs A synchronous high-frequency sinusoidal rhythm of 36-42 Hz was found in the amygdala and olfactory structures in the paradoxical phase of sleep This olfacto-amygdaloid rhythm, unlike that of aroused animals, was not the result of olfactory stimulation and persisted in dogs with tracheal breathing Its generation is probably of central origin A comparison of the dynamics of this electrical activity with somatic, automatic and EEG-correlates of sleep gives reasons to regard the olfacto-amygdaloid rhythm of 36-42 Hz as a specific EEG-correlate of the paradoxical sleep stage in dogs (Author)

A75-40717 # **Labyrinth and extralabyrinth effects on the background activity of spinal interneurons in cats subjected to rocking (Labirintnye i ekstralabirintnye vliianiia na fonovuiu aktivnost' spinal'nykh interneironov koshek pri kachanii)** G S Aizikov and A V Mokrousova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) *Neirofiziologiia*, vol 7, no 3, 1975, p 243-250 38 refs In Russian

A75-40718 # **On the effect of hypothalamic nuclei on electrical activity of optic cortex neurons (O vliianii gipotalamicheskikh iader na elektricheskuiu aktivnost' neironov zritel'noi kory)** R R Velikaia (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR) *Neirofiziologiia*, vol 7, no 3, 1975, p 313-316 11 refs In Russian

Background and light-evoked activity of single neurons in the rabbit optic cortex was investigated before and after electrical stimulation of the anterior and posterior hypothalamic nuclei No distinct reciprocity between the effect of the anterior and posterior hypothalamic areas on the optic cortex neurons was found Long cyclic changes in the background rhythmic activity of the neurons were observed after stimulation of different hypothalamic nuclei A modulating effect of these nuclei on the activity of the optic cortex neurons was also detected under conditions of retinal stimulation by repetitive light (Author)

A75-40734 # **On whether sleep affects the consolidation of perceived reactions (Vliiaet li son na konsolidatsiiu osoznavaemykh reaktsii)** L G Voronin, V F Konovalov, and R Ia Senina (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino on Oka, USSR) *Akademiia Nauk SSSR, Doklady*, vol 221, Apr 21, 1975, p 1469-1472 12 refs In Russian

The paper describes an experiment in which human subjects had to solve a logical problem under normal conditions and then had to resolve the same problem after a period of either normal wakefulness, normal sleep, or forced wakefulness during the night The intensity of the cutaneous galvanic reflex and the variation of the ECG during solution of the problem were recorded in each case Reproduction of the solution algorithm in the second test was always faster than in the original test, but was accompanied by less pronounced CGR and ECG changes, indicating that fading of electrographic components of trace processes takes place as the brain fixes conscious information in the long-term memory It was also found that sleep or its deprivation has no evident effect on subsequent reproduction of motor habits developed during active participation of the secondary signal system, suggesting that fixation of these motor reactions in the long-term memory occurs in some small time interval before the onset of sleep P T H

A75-40852 # **Spacelab atmosphere storage and revitalization system** H Hassan, J Becker, and H Eckert (ESRO, European Space Research and Technology Centre, Noordwijk, Netherlands) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif, July 21-24, 1975, ASME Paper 75-ENAs-61* 11 p Members, $1 00, nonmembers, $3 00

The Spacelab Environmental Control and Life Support System (ECLS) consists of Atmosphere Storage and Control Section (ASCS) and Atmosphere Revitalization Section (ARS) A shirt sleeve environment, compatible with the Shuttle Orbiter, is maintained in the pressurised module of the Spacelab Gaseous oxygen and nitrogen storage provides the consumable gases for a 7 day mission Carbon di-oxide removal, humidity and temperature control is effected by the cabin airloop which rejects its heat to a waterloop A separate avionics airloop is used to cool the rack mounted subsystem and experiment equipment A majority of the ECLS equipment is common with the Shuttle Orbiter Authorization to proceed with the development of the Spacelab ECLS was given in June 1974 Hardware deliveries for interpreted vehicle tests begin in 1977 and flight unit deliveries are scheduled for the first quarter of 1978 to meet the first Spacelab flight in early 1980. (Author)

A75-40853 # **Engineering design studies for a Shuttle Waste Management System** S R Hunt, Jr and R A Burt (GE Valley Forge Space Center, Philadelphia, Pa) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif, July 21-24, 1975, ASME Paper 75-ENAs-56* 7 p Members, $1 00, nonmembers, $3 00

Biowaste management for Shuttle/Orbiter will differ from the Apollo and Skylab Waste Management System in that the Shuttle Waste Collector System (WCS) will accommodate both males and females, operate essentially automatically without the necessity of handling of human waste material, be earthlike in its operational use, require little training for proper use, and be easily maintained and serviced for reuse This paper gives an overview of some of the problems associated with the development of the Shuttle WCS and presents the results of studies conducted to obtain engineering design, human factors and operational data for the Shuttle WCS A basic design for the Shuttle WCS is given including a description of system functions Studies conducted in normal gravity conditions for design development are described along with studies used to define system design characteristics and parameters conducted in zero 'g' as simulated by neutral buoyancy techniques and as generated by Keplarian trajectory in KC-135 aircraft (Author)

A75-40855 * # **Orbiter Active Thermal Control System description.** G E Laubach (Rockwell International Corp , Space Div , Downey, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-58* 8 p Members, $1 00, nonmembers, $3 00 Contract No NAS9-14000

A brief description of the Orbiter Active Thermal Control System (ATCS) including (1) major functional requirements of heat load, temperature control and heat sink utilization, (2) the overall system arrangement, and (3) detailed description of the elements of the ATCS (Author)

A75-40856 * # **The Shuttle Orbiter Cabin Atmospheric Revitalization Systems** C F Ward and W L Owens (Rockwell International Corp , Downey, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-55* 9 p Members, $1 00, nonmembers, $3 00 Contract No NAS9-14000

The Orbiter Atmospheric Revitalization Subsystem (ARS) and Pressure Control Subsystem (ARPCS) are designed to provide the flight crew and passengers with a pressurized environment that is both life-supporting and within crew comfort limitations The ARPCS is a two-gas (oxygen-nitrogen) system that obtains oxygen from the Power Reactant Supply and Distribution (PRSD) subsystem and nitrogen from the nitrogen storage tanks The ARS includes the water coolant loop, cabin CO2, odor, humidity and temperature control, and avionics cooling Baseline ARPCS and ARS changes since 1973 include removal of the sublimator from the water coolant loop, an increase in flowrates to accommodate increased loads, elimination of the avionics bay isolation from the cabin, a decision to have an inert vehicle during ferry flight, elimination of coldwall tubing around windows and hatches, and deletion of the cabin heater (Author)

A75-40858 # **Compact heat exchangers for the Space Shuttle** R B Trusch and J Nason (United Aircraft Corp., Hamilton Standard Div , Windsor Locks, Conn) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-54* 14 p Members, $1 00, nonmembers, $3 00

Lightweight, high density plate-fin heat exchangers will be used in the Space Shuttle Atmosphere Revitalization Subsystem (ARS) and in the Freon Coolant Loop (FCL) An advance in the state-of-the art of compact heat exchanger design has been effected with the use of fin heights of 0 020 and 0 002 in fin thicknesses The advance provided a significant weight savings to be made on nine types of ARS and FCL heat exchangers The GSE heat exchanger, for example, provides cooling in a core designed to transfer heat at the rate of 0 43 kw/cu in of core, including a redundant cooling pass The air to water, water to Freon 21, Freon 21 to Freon 21, Freon 21 to FC-40, Freon 21 to Hydraulic fluid heat exchanger configurations are described A summary of analytical design techniques, trade-off studies, and test results are presented as well as the approaches selected for handling up to five heat transport fluids in a single core unit (Author)

A75-40861 # **Aircraft on-board electrochemical breathing oxygen generators.** J W Harrison (General Electric Co , Aircraft Equipment Div , Wilmington, Mass) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-51* 9 p Members, $1 00, nonmembers, $3 00

Two unique electrochemical generation systems have been developed for use as on-board breathing oxygen supplies for military aircraft These systems offer significant advantages over existing liquid oxygen systems in the areas of logistics and ground support The systems utilize solid polymer electrolyte oxygen concentrator cells to remove and compress oxygen from jet engine bleed air electrochemically Oxygen is delivered from the cells at greater than 99 5% purity and pressures to 350 psi The system currently undergoing pre-flight rating testing generates 26 standard liters per minute It is designated to fit the liquid oxygen compartment and available services of the F-14 aircraft The original system is configured to fit the liquid oxygen compartment and available services of the F-4 aircraft This system includes a rebreather such that only make up oxygen is generated with a commensurate reduction in electrical power requirements (Author)

A75-40862 * # **Design and test status for life support applications of SPE oxygen generation systems** W A Titterington and A C Erickson (General Electric Co , Lynn, Mass) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-50* 9 p Members, $1 00, nonmembers, $3 00 NASA-Navy-supported research

An advanced six-man rated oxygen generation system has been fabricated and tested as part of a NASA/JSC technology development program for a long lived, manned spacecraft life support system Details of the design and tests results are presented The system is based on the Solid Polymer Electrolyte (SPE) water electrolysis technology and its nominal operating conditions are 2760 kN/sq m (400 psia) and 355 K (180 F) with an electrolysis module current density capability up to 350 mA/sq cm (326 ASF) The system is centered on a 13-cell SPE water electrolysis module having a single cell active area of 214 sq cm (33 sq in) and it incorporates instrumentation and controls for single pushbutton automatic startup/shutdown, component fault detection and isolation, and self-contained sensors and controls for automatic safe emergency shutdown The system has been tested in both the orbital cyclic and continuous mode of operation Various parametric tests have been completed to define the system capability for potential application in spacecraft environmental systems (Author)

A75-40863 * # **Potable water recovery for spacecraft application by electrolytic pretreatment/air evaporation.** G W Wells (McDonnell Douglas Astronautics Co , Huntington Beach, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-49* 44 p 17 refs Members, $1 00, nonmembers, $3 00 Contract No NAS1-11781

A process for the recovery of potable water from urine using electrolytic pretreatment followed by distillation in a closed-cycle air evaporator has been developed and tested Both the electrolytic pretreatment unit and the air evaporation unit are six-person, flight-concept prototype, automated units Significantly extended wick lifetimes have been achieved in the air evaporation unit using electrolytically pretreated, as opposed to chemically pretreated, urine feed Parametric test data are presented on product water quality, wick life, process power, maintenance requirements, and expendable requirements (Author)

A75-40864 * # **Parametric evaluation of a dual-layer dynamic hyperfiltration membrane for recovery of spacecraft wash water at**

elevated temperature C A Brandon and J L Gaddis (Clemson University, Clemson, S C.) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif, July 21-24, 1975, ASME Paper 75-ENAs-46* 10 p 7 refs Members, $1 00, nonmembers, $3 00 Contract No NAS9-13669

Performance data consisting of solute rejections and product flux have been measured, as dependent on the operational parameters These parameters were pressure, 5,000,000 N/sq m (750 psia) to 7,000,000 N/sq m (1040 psia), temperature, 347 K (165 F) to 368 K (200 F), velocity, 1 6 m/s to 10 m/s, and concentration (up to 14x) Tests were carried out on analog wash water Data taken include rejections of organic materials (TOC), ammonia, urea, and an assortment of ions The membrane used was a dual-layer, polyacrylic acid over zirconium oxide, deposited in situ on a porcelain ceramic substrate (Author)

A75-40866 * # **A 2 2 sq m /24 sq ft/ self-controlled deployable heat pipe radiator - Design and test** F Edelstein (Grumman Aerospace Corp , Bethpage, N Y) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-43* 9 p Members, $1 00, nonmembers, $3 00 Contract No NAS8-29905

An all heat pipe, deployable radiator has been developed which can effectively control pumped fluid loop temperatures under varying loads using variable conductance panel heat pipes The 2 2 sq m (24 sq ft) aluminum panel can be coupled to either a fluid header or a flexible heat pipe header capable of transporting 850 watts in a 90-deg bent configuration Test results support the feasibility of using this system to passively control Freon-21 loop temperatures (Author)

A75-40867 * # **Self-Contained Heat Rejection Module for future spacecraft** M L Fleming, J L Williams, J D Baskett, and J W Leach (LTV Aerospace Corp , Vought Systems Div , Dallas, Tex) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-42* 8 p 7 refs Members, $1 00, nonmembers, $3 00 Contracts No NAS9-13533, No NAS9-14408

This paper discusses development of a Self-Contained Heat Rejection Module (SHRM) which can be used on a wide variety of future spacecraft launched by the space shuttle orbiter The SHRM contains radiators which are deployed by a scissor-mechanism and the flow equipment including pumps, accumulator, by-pass valves, and controllers necessary to reject heat from those radiators Heat transfer between SHRM and the parent vehicle is effected by a contact heat exchanger This device provides heat transfer between two separate flow loops through a mechanical connection This approach reduces the time required to attach the SHRM to the payload, and increases the reliability of the SHRM flow loop since breaking into the fluid system in the field is not required The SHRM concept also includes a refrigeration system to increase heat rejection capacity in adverse environments, or to provide for a lower return temperature, down to -23 C (Author)

A75-40868 * # **Space Tug thermal control** T L Ward (Martin Marietta Aerospace, Denver, Colo) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-41* 8 p Members, $1 00, nonmembers, $3 00 Contract No NAS8-29670

The future development of full capability Space Tug will impose strict requirements upon the thermal design While requiring a reliable and reusable design, Space Tug must be capable of steady-state and transient thermal operation during any given mission for mission durations of up to seven days and potentially longer periods of time Maximum flexibility and adaptability of Space Tug to the mission model requires that the vehicle operate within attitude constraints throughout any specific mission These requirements were translated into a preliminary design study for a geostationary deploy and retrieve mission definition for Space Tug to determine the thermal control design requirements Results of the study are discussed with emphasis given to some of the unique avenues pursued during the study, as well as the recommended thermal design configuration (Author)

A75-40869 * # **Improved thermal storage material for portable life support systems** J D Kellner (United Aircraft Research Laboratories, East Hartford, Conn) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-40* 9 p Members, $1 00, nonmembers, $3 00 NASA-supported research

The availability of thermal storage materials that have heat absorption capabilities substantially greater than water-ice in the same temperature range would permit significant improvements in performance of projected portable thermal storage cooling systems A method for providing increased heat absorption by the combined use of the heat of solution of certain salts and the heat of fusion of water-ice was investigated This work has indicated that a 30 percent solution of potassium bifluoride (KHF2) in water can absorb approximately 52 percent more heat than an equal weight of water-ice, and approximately 79 percent more heat than an equal volume of water-ice The thermal storage material can be regenerated easily by freezing, however, a lower temperature must be used, 261 K as compared to 273 K for water-ice This work was conducted by the United Aircraft Research Laboratories as part of a program at Hamilton Standard Division of United Aircraft Corporation under contract to NASA Ames Research Center (Author)

A75-40870 * # **Benefits of advanced space suits for supporting routine extravehicular activity** L R Alton, E H Bauer (NASA, Ames Research Center, Moffett Field, Calif), and J W Patrick (Rockwell International Corp , Space Div , Downey, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-39* 7 p 12 refs Members, $1 00, nonmembers, $3 00

Technology is available to produce space suits providing a quick-reaction, safe, much more mobile extravehicular activity (EVA) capability than before Such a capability may be needed during the shuttle era because the great variety of missions and payloads complicates the development of totally automated methods of conducting operations and maintenance and resolving contingencies Routine EVA now promises to become a cost-effective tool as less complex, serviceable, lower-cost payload designs utilizing this capability become feasible Adoption of certain advanced space suit technologies is encouraged for reasons of economics as well as performance (Author)

A75-40871 # **ALSA malfunction simulator evolution** P D Peterson (AiResearch Manufacturing Company of California, Torrance, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-38* 6 p Members, $1 00, nonmembers, $3 00

All extra-vehicular activity (EVA) life-support equipment has required that crewmen memorize contingency procedures During the Skylab program, a simulator was built to help astronauts memorize these procedures and understand the effects on the life-support system When crew training was complete, a study effort resulted in modification of the simulator to eliminate the requirement for cue cards and memorization of these procedures This paper presents the evolution of the simulator from its inception to the end of the program (Author)

A75-40872 * # **Design and the parametric testing of the Space Station Prototype integrated vapor compression distillation water recovery module** W F Reveley (NASA, Johnson Space Center, Houston, Tex) and P P Nuccio (Chemtric, Inc , Rosemont, Ill) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-37* 10 p 5 refs Members, $1 00, nonmembers, $3 00

Potable water for the Space Station Prototype life support system is generated by the vapor compression technique of vacuum distillation A description of a complete three-man modular vapor compression water renovation loop that was built and tested is presented, included are all of the pumps, tankage, chemical post-treatment, instrumentation, and controls necessary to make the loop representative of an automatic, self-monitoring, null gravity system The design rationale is given and the evolved configuration is described Presented next are the results of an extensive parametric test during which distilled water was generated from urine and urinal flush water with concentration of solids in the evaporating liquid increasing progressively to 60 percent Water quality, quantity and production rate are shown together with measured energy consumption rate in terms of watt-hours per kilogram of distilled water produced (Author)

A75-40873 # **Emissions of volatiles from non-metallic shipboard materials - Electrical insulations.** P Demas (U S Naval Material Command, Naval Ship Research and Development Center, Annapolis, Md) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-35* 10 p 7 refs

An experimental apparatus, trapping procedures and analytical techniques were developed to determine the nature and amounts of volatiles emitted by nonmetallic shipboard materials throughout the range from ambient to pyrolytic temperatures In designing the apparatus, attempts were made to simulate normal and overheat shipboard conditions with respect to both temperature and oxygen depletion during smoldering and fire situations Wet chemical and instrumental analytical procedures have been assembled or modified for the qualitative and quantitative determination of organic and inorganic outgassed products Such outgassed products from shipboard materials can be of diverse chemical nature and could have harmful effects on personnel and/or equipment Because of the multitude of the individual chemical compounds involved, only those with known hazardous significance have been considered for determination Materials reported here are five samples of electrical insulation used in shipboard wire and cable polyvinyl chloride, aromatic polyamide, polyethylene, neoprene and polyimide (Author)

A75-40874 * # **Development of an automated potable water bactericide monitoring unit** J M Walsh, C C Brawner (Beckman Instruments, Inc , Anaheim, Calif), and R L Sauer (NASA, Johnson Space Center, Life Sciences Directorate, Houston, Tex) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-36* 7 p Members, $1 00, nonmembers, $3 00

A monitor unit has been developed that permits the direct determination of the level of elemental iodine, used for microbiological control, in a spacecraft potable water supply system Salient features of unit include low weight, volume and maintenance requirements, complete automatic operation, no inflight calibration, no expendables (except electrical current) and high accuracy and precision This unit is capable of providing a signal to a controller that, in turn, automatically adjusts the addition rate of iodine to the potable water system so that a predetermined level of iodine can be maintained In addition, the monitor provides a reading whereby the crewman can verify that the proper amount of iodine (within a range) is present in the water A development history of the monitor is presented along with its design and theory of operation Also presented are the results generated through testing of the unit in a simulated Shuttle potable water system (Author)

A75-40875 * # **Biowaste monitoring system for Shuttle** G L Fogal (GE Valley Forge Space Center, Philadelphia, Pa) and R L Sauer (NASA, Johnson Space Center, Life Sciences Directorate, Houston, Tex) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-34* 8 p Members, $1 00, nonmembers, $3 00

The acquisition of crew biomedical data has been an important task on all manned space missions from Project Mercury through the recently completed Skylab Missions The monitoring of metabolic wastes from the crew is an important aspect of this activity On early missions emphasis was placed on the collection and return of biowaste samples for post-mission analysis On later missions such as Skylab, equipment for inflight measurement was also added Life Science experiments are being proposed for Shuttle missions which will require the inflight measurement and sampling of metabolic wastes In order to minimize the crew impact associated with these requirements, a high degree of automation of these processes will be required This paper reviews the design and capabilities of urine biowaste monitoring equipment provided on past-manned space programs and defines and describes the urine volume measurement and sampling equipment planned for the Shuttle Orbiter program (Author)

A75-40876 # **A new design NDIR atmosphere analyzer for submarines** N Hatfield, T Johnson, and M Greenberg (U S Naval Material Command, Ship Research and Development Center, Annapolis, Md) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-31* 5 p Members, $1 00, nonmembers, $3 00

The development of a nondispersive IR analyzer for monitoring submarine atmospheres with improved reliability is discussed together with some test results The instrument was designed to measure simultaneously six atmospheric constituents in the parts-per-million range and to have a mean time between failure of at least 3000 hours Described features include dual see-through pneumatic IR detectors in both the sample and reference channels, an aluminum diaphragm, and modular construction It is noted that the prototype instrument has operated more than 15,000 hours in the laboratory and aboard a submarine without a failure in the sensing channels F G M

A75-40877 * # **Research and development of an electrochemical biocide reactor** G G See, C A Bodo (Life Systems, Inc , Cleveland, Ohio), and J P Glennon (U S Army, Medical Research and Development Command, Washington, D C) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-33* 14 p 18 refs Members, $1 00, nonmembers, $3 00 NASA-Army-supported research

An alternate disinfecting process to chemical agents, heat, or radiation in an aqueous media has been studied The process is called an electrochemical biocide and employs cyclic, low-level voltages at chemically inert electrodes to pass alternating current through water and, in the process, to destroy microorganisms The paper describes experimental hardware, methodology, and results with a tracer microorganism (Escherichia coli) The results presented show the effects on microorganism kill of operating parameters, including current density (15 to 55 mA/sq cm (14 to 51 ASF)), waveform of applied electrical signal (square, triangular, sine), frequency of applied electrical signal (0 5 to 1 5 Hz), process water flow rate (100 to 600 cc/min (1 6 to 9 5 gph)), and reactor resident time (0 to 4 min) Comparisons are made between the disinfecting property of the electrochemical biocide and chlorine, bromine, and iodine (Author)

A75-40878 * # **Development of an Advanced Static Feed Water Electrolysis Module.** F H Schubert, R A Wynveen, F C Jensen (Life Systems, Inc , Cleveland, Ohio), and P D Quattrone (NASA, Ames Research Center, Moffett Field, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-30* 15 p 18 refs Members, $1 00, nonmembers, $3 00 NASA-supported research

A Static Feed Water Electrolysis Module (SFWEM) was developed to produce 0 92 kg/day (2 0 lb/day) of oxygen (O2) Specific objectives of the program's scope were to (1) eliminate the need for

feed water cavity degassing, (2) eliminate the need for subsystem condenser/separators, (3) increase current density capability while decreasing electrolysis cell power (i e., cell voltage) requirements, and (4) eliminate subsystem rotating parts and incorporate control and monitor instrumentation A six-cell, one-man capacity module having an active area of 0 00929 sq m (0 10 sq ft) per cell was designed, fabricated, assembled, and subjected to 111 days (2664 hr) of parametric and endurance testing The SFWEM was successfully operated over a current density range of 0 to 1076 mA/sq cm (0 to 1000 ASF), pressures of ambient to 2067 kN/sq m (300 psia), and temperatures of ambient to 366 K (200 F) During a 94-day endurance test, the SFWEM successfully demonstrated operation without the need for feed water compartment degassing (Author)

A75-40879 # **Aircraft oxygen systems - Independence of ground equipment and service** A J Adduci (USAF, Aircraft Oxygen Systems, Wright-Patterson AFB, Ohio) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-26* 7 p. Members, $1 00, nonmembers, $3 00

Since the advent of high altitude flight, supplemental oxygen has been required to sustain the aircrew members' ability to function The need for oxygen thus generated the requirement to support the aircraft oxygen system, this is 'Ground Support Equipment' The first systems used gaseous oxygen This gave way to liquid oxygen (LOX) in order to lower installed weight on the aircraft LOX increased both the quantity and cost of the 'Ground Support Equipment' required Today oxygen systems are being developed to eliminate ground support equipment and some of these are already in service On aircraft which require oxygen supplied to all personnel during the entire flight operation (these are fighter and bomber type aircraft), systems which extract oxygen from air in the correct quantity and quality are being developed These systems ideally will require no service for hundreds of operating hours Solid oxygen systems are now employed of the C-5A, DC-10 and L-1011 aircraft The units are emergency oxygen for passengers in case of decompression The solid oxygen requires service only after use. (Author)

A75-40881 # **Design fabrication and evaluation of a trace contaminant control system** T M Olcott (Lockheed Missiles and Space Co , Inc , Sunnyvale, Calif). *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-23* 16 p 5 refs Members, $1 00, nonmembers, $3 00

The equipment being developed for cabin contaminant control utilizes catalytic oxidation, chemisorption and charcoal adsorption Cabin air is drawn through a nonregenerable charcoal bed to remove easily adsorbed contaminants The charcoal is impregnated with phosphoric acid to provide ammonia control A small portion of the effluent passes through a regenerable charcoal bed, a pre-sorbent bed, a catalytic oxidizer and a post-sorbent bed The regenerable bed controls more-difficult-to-adsorb contaminants such as halogenated compounds and is desorbed daily by exposure to vacuum and heating The lithium hydroxide pre-sorbent eliminates acid poisoning of the catalytic oxidizer The catalytic oxidizer contains a palladium catalyst to oxidize hydrocarbons not adsorbed in the charcoal beds A lithium hydroxide post-sorbent bed controls potential undesirable products of oxidation. The system design requirements, design analysis, system description, and the results of the design verification testing are presented (Author)

A75-40882 * # **Carbon dioxide reduction by the Bosch process** M P Manning and R C Reid (MIT, Cambridge, Mass) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-22* 14 p 8 refs Members, $1 00, nonmembers, $3 00 Grant No NGR-22-009-723

Prototype units for carrying out the reduction of carbon dioxide to elementary carbon have been built and operated successfully In some cases, however, startup difficulties have been reported Moreover, the recycle reactor product has been reported to contain only small amounts of water and undesirably high yields of methane This paper presents the results of the first phase of an experimental study that was carried out to define the mechanisms occurring in the reduction process Conclusions are drawn and possible modifications to the present recycle process are suggested (Author)

A75-40883 * # **Reforming and decomposition of glucose in an aqueous phase** S Amin, R C Reid, and M Modell (MIT, Cambridge, Mass) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-21* 9 p 8 refs Members, $1 00, nonmembers, $3 00 NASA-supported research

Exploratory experiments have been carried out to study the decomposition of glucose, a typical carbohydrate, in a high temperature-high pressure water reactor The objective of the study was to examine the feasibility of such a process to decompose cellulosic waste materials in long-term space missions At temperatures below the critical point of water, glucose decomposed to form liquid products and char Little gas was noted with or without reforming catalysts present The rate of the primary glucose reaction increased significantly with temperature Partial identification of the liquid phase was made and the C H O ratios determined for both the liquid and solid products One of the more interesting results from this study was the finding that when glucose was injected into a reactor held at the critical temperature (and pressure) of water, no solid products formed Gas production increased, but the majority of the carbon was found in soluble furans (and furan derivatives) This significant result is now being investigated further (Author)

A75-40884 # **Air cycle air conditioning of turbine powered helicopters.** L B Buss and A J Dauer (AiResearch Manufacturing Company of California, Torrance, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-20* 9 p Members, $1 00, nonmembers, $3 00

The first aircraft to use air cycle air conditioning was the Lockheed F-80 and now nearly all turbine powered fixed wing aircraft use this type of system The Bell Huey Cobra helicopter was the first production helicopter to be fitted with air cycle air conditioning and since then over a dozen other helicopter models have utilized air cycle air conditioning systems The paper discusses the various types of air cycle systems and how, through ventilation, humidity control, heating and cooling, they can convert the turbine powered helicopter 'greenhouse' into a very comfortable environment in which to fly (Author)

A75-40885 # **The Navy fighter pilot helmet oxygen mask improvement program** R Z Snyder (U S Naval Material Command, Naval Air Development Center, Warminster, Pa) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-19* 6 p Members, $1 00, nonmembers, $3 00

The Navy APH-6 Helmet has become a platform for the addition of new features of improvement such as dual visors, sound attenuating earcups and the VTAS (Visual Target Acquisition System). These have increased the bulk and weight of the helmet system to the point where it is unstable on the head under high 'G' and too heavy to wear over a long period of time The Naval Air Development Center and the Naval Air Systems Command have developed new lightweight, form-fit, mold-in-place helmets with an integrated oxygen mask system This paper describes the logistics problems encountered in remote form-fit helmet concepts and how these were resolved by helmet mold-in-place form-fit systems The weight of the helmet is reduced by a lightweight shell material and by the use of lightweight communication components, and introducing a new skin conductor microphone placed on the earcup seal The oxygen mask has been reduced in weight and profile and has become an integral of the helmet system (Author)

A75-40886 * # **Industrial and biomedical use of aerospace personal cooling garments** B A Williams, G N McEwen, Jr , L D Montgomery (NASA, Ames Research Center, Environmental Control Research Branch, Moffett Field, Calif), and W E Elkins (Acurex Corp , Mountain View, Calif) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-18* 5 p 6 refs Members, $1 00, nonmembers, $3 00

Liquid-cooled garments (LCG) have been developed which utilize liquid-cooled modules rather than the network of tygon tubing typical of Apollo LCG's The ultra-thin, heat-sealed, polyurethane modules are situated over the body to cover 50 percent of the body surface area with special emphasis on the 'working' muscles and the head-neck area These garments are being designed specifically for industrial and biomedical uses, such as a head-neck cooling system which is being tested for race-car drivers, tractor drivers, truck drivers, or a head-neck cooling system tested for the reduction of the scalp hair loss which normally accompanies cancer treatments A combined head-neck and thorax unit is being developed for use during mine distaster rescue operations, and for other hazardous hot applications Finally applications for head-neck and partitional cooling are anticipated for military pilots, tank drivers, and heavy equipment operations (Author)

A75-40888 # **Analysis of a regenerable polyethyleneimine carbon dioxide and humidity control system** C H Lin (Lockheed Electronics Co , Inc , Houston, Tex) *ASME, SAE, AIAA, ASMA, and AIChE, Intersociety Conference on Environmental Systems, San Francisco, Calif , July 21-24, 1975, ASME Paper 75-ENAs-16* 6 p 9 refs Members, $1 00, nonmembers, $3 00

A mathematical model is presented for a regenerable polyethyleneimine carbon dioxide and humidity control system which is being developed for possible use in the Space Shuttle The model simulates the coadsorption of CO_2 and water by the porous beds of polyethyleneimine coated particles in the system, the vacuum desorption and regeneration of the beds, and the heat transfer between alternatively adsorbing-desorbing adjacent beds that controls the temperature of the system A modified Blake-Kozeny equation, which takes into account the slip-flow effect at an extreme low pressure, is used to calculate the pressure drop in a bed during vacuum desorption The heat transfer between the adjacent adsorbing-desorbing beds during the cyclic operations of the system is governed by three diffusion-type partial differential equations Evaluations of three heat transfer coefficients are required for solving these equations (Author)

A75-41055 # **Classical and modern aspects of motor dominance formation in man (Klassicheskie i sovremennye aspekty formirovaniia motornoi dominanty u cheloveka)** E B Sologub, K Iu Azhitskii, and N V Smagin (Leningradskii Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Fiziologicheskii Zhurnal SSSR,* vol 61, June 1975, p 838-845 15 refs In Russian

Autocorrelation and spectral analysis of the EEGs of exercising individuals are performed to study and evaluate the significance of rhythm assimilation in the formation of motor dominance in the human cortex Ukhtomski's classical theory of dominance is complemented by modern concepts about the role of phase relationships in cortical activity to determine intercentral links and carry out functional differentiation of acting and secondary cortical structures The results make it possible to identify the stages of motor dominance development at the cortical level, to estimate the possible mechanisms underlying the concentration of dominant constellations, and to reveal the significance of rhythmic coadjustment between basic cortical zones and of phase coincidence of fluctuations to improve the effectiveness of human motor activity S D

A75-41056 # **Some characteristics of neuron responses of the upper and lower layers in the striate cortex (Nekotorye osobennosti neironnykh reaktsii verkhnikh i nizhnikh sloev striarnoi kory)** V M Dukanich (Rostovskii-na-Donu Gosudarstvennyi Universitet, Rostov, USSR) *Fiziologicheskii Zhurnal SSSR,* vol 61, June 1975, p 962-967 19 refs In Russian

Responses to light flash of 440 neurons (219 in upper layers and 221 in lower layers) in the visual cortex of albino rats are studied It is found that stimulated responses predominate in the upper layer of the striate cortex An analysis of time parameters of the secondary activation of stimulated responses reveals 5 types of neuron response An increase in stimulus intensity leads to a redistribution of response intensity in primary and secondary activations, where enhancement of primary activation is accompanied by a decrease in secondary activation Information indices of neuron responses in both layers exhibit different behavior S D

A75-41058 # **A man and a collective as elements of the control system (Chelovek i kollektiv kak elementy sistemy upravleniia)** M A Aizerman *Avtomatika i Telemekhanika,* May 1975, p 83-96 18 refs In Russian

The differences between mathematical models of software or hardware systems and of models of systems made of people and their collectives are described The related problems include multicriterion nature of a personality and a collective, conscious behavior of elements in the system, the dynamic nature of processes in the systems and the part played by game balances in their description It is proved that a new speciality studying the properties of people and collectives as elements of control systems should emerge (Author)

A75-41143 # **Disorder in the conditioned reflex activity and morphological changes in the brain of rats deprived of paradoxical sleep (Narusheniia uslovnoreflektornoi deiatel'nosti i morfologicheskie izmeneniia v golovnom mozge krys pri deprivatsii paradoksal'nogo sna)** R I Kruglikov, M M Aleksandrovskaia, and T N Dish (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti,* vol 25, May-June 1975, p 471-476 14 refs In Russian

A75-41144 # **Effect of sudden illumination on the saccadic movements of the eye (Vliianie zasveta na neproizvol'nye skachki glaz)** V A Filin (Ministerstvo Meditsinskoi Promyshlennosti, Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR) and S P Sidorov (Vrachebno-Fizkul'turnyi Dispanser, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti,* vol 25, May-June 1975, p 603-609 15 refs In Russian

A photoelectronic technique is used to study the micromovements (horizontal component) of the eye under conditions of sudden contour and diffused monocular illumination with a luminance of 100 nit It is shown that sudden contour illumination reduces both the amplitude and the frequency of the observed saccades, that this effect is more pronounced with illumination of the eye in complete darkness while testees look straight ahead without a fixation point, and that diffused illumination results in a less pronounced reduction in saccade amplitude The presence of a visual fixation point is found to reduce markedly the effect of sudden illumination on saccade amplitude An increase in the luminance of the fixation point leads to a reduction in saccade amplitude and frequency S D

A75-41238 # **Mathematical modeling in biophysics (Matematicheskoe modelirovanie v biofizike).** Iu M. Romanovskii, N V Stepanova, and D S Chernavskii Moscow, Izdatel'stvo Nauka, 1975 344 p 283 refs In Russian.

The present work is concerned with the essentials of developing kinetic models of biological processes, along with techniques for studying these models Problems discussed are the origin of life and the evolution of species, the differentiation of tissues and morphogenesis, the culture of microorganisms and engineering microbiology, the dynamics of the immune response, and the thermodynamics of open systems and its role in the description of biological systems

Some statistical aspects of biological kinetics are discussed, such as a statistical model for fermentative reactions and the mean lifetime of a predator-victim system S.D

A75-41264 Numerical solution of steady-state electromagnetic scattering problems using the time-dependent Maxwell's equations A Taflove and M. E Brodwin (Northwestern University, Evanston, Ill.) *IEEE Transactions on Microwave Theory and Techniques*, vol MTT-23, Aug 1975, p 623-630 7 refs

A numerical method is described for the solution of the electromagnetic fields within an arbitrary dielectric scatterer of the order of one wavelength in diameter The method treats the irradiation of the scatterer as an initial value problem At t = 0, a plane-wave source of frequency f is assumed to be turned on The diffraction of waves from this source is modeled by repeatedly solving a finite-difference analog of the time-dependent Maxwell's equations Time stepping is continued until sinusoidal steady-state field values are observed at all points within the scatterer The envelope of the standing wave is taken as the steady-state scattered field As an example of this method, the computed results for a dielectric cylinder scatterer are presented (Author)

A75-41391 * Effect of shape and size of lung and chest wall on stresses in the lung D L Vawter, F L Matthews, and J. B West (California, University, La Jolla, Calif., Imperial College of Science and Technology, London, England) *Journal of Applied Physiology*, vol 39, July 1975, p 9-17 14 refs Grants No NGL-05-009-109, No NIH-HL-13687-03, No NIH-HL-14169-03, No NIH-HL-17731-01

To understand better the effect of shape and size of lung and chest wall on the distribution of stresses, strains, and surface pressures, we analyzed a theoretical model using the technique of finite elements First we investigated the effects of changing the chest wall shape during expansion, and second we studied lungs of a variety of inherent shapes and sizes We found that, in general, the distributions of alveolar size, mechanical stresses, and surface pressures in the lungs were dominated by the weight of the lung and that changing the shape of the lung or chest wall had relatively little effect Only at high states of expansion where the lung was very stiff did changing the shape of the chest wall cause substantial changes Altering the inherent shape of the lung generally had little effect but the topographical differences in stresses and surface pressures were approximately proportional to lung height The results are generally consistent with those found in the dog by Hoppin et al (1969) (Author)

A75-41392 Aldosterone dynamics during graded exercise at sea level and high altitude. J T Maher, L G Jones, L H Hartley, G H Williams, and L. I Rose (U S Army, Research Institute of Environmental Medicine, Natick, Peter Bent Brigham Hospital, Boston, Mass.) *Journal of Applied Physiology*, vol 39, July 1975, p 18-22 27 refs

Hormonal responses to graded exercise of eight male subjects (age 19-23 yr) are studied at sea level and after 1 (acute) and 11 (chronic) days at a high altitude of 4,300 m Caloric, water, and electrolyte intakes are controlled along with temperature and humidity Aldosterone and cortisol are determined simultaneously in peripheral plasma, together with renin activity and angiotensin II in the plasma A statistical analysis of the data obtained suggests that aldosterone is predominantly under the control of the renin-angiotensin system during graded exercise at sea level and that the response of this system is altered with acute hypobaric hypoxia The mechanism responsible for the suppression of renin secretion in acute hypoxia is not readily apparent and calls for further investigation S D

A75-41393 * Fluctuations in O2 stores and gas exchange with passive changes in posture J A Loeppky and U C Luft (Lovelace Foundation for Medical Education and Research, Albuquerque, N Mex.) *Journal of Applied Physiology*, vol 39, July 1975, p 47-53 16 refs Contract No NAS9-12572

The purpose of the present study is to determine the effects of changes in posture on oxygen transfer at the mouth and pulmonary capillary membrane and to observe concomitant subtle changes in ventilation under specified assumptions Breath-by-breath calculations are carried out with a box-balloon spirometer and mass spectrometer Measurements are made before, during, and after passive tilt to 60 deg and on return to recumbency after 10 min erect It is found that from supine to upright oxygen stores in the lung increases rapidly and oxygen stores in the blood drops slowly, creating a net deficit in oxygen transfer at the mouth of 130 ml in 10 min Changes in oxygen stores in the blood result from shifts in blood volume and flow more than from changes in cardiac output Refilling of oxygen stores in the blood is found to cause transient hypoxia with substantial hyperpnea S D

A75-41394 Oxygen uptake/heart rate relationship in leg and arm exercise, sitting and standing Z Vokac, H Bell, E Bautz-Holter, and K Rodahl (Institute of Work Physiology, Oslo, Norway) *Journal of Applied Physiology*, vol 39, July 1975, p 54-59 27 refs

A75-41395 * Comparison of water immersion and saline infusion as a means of inducing volume expansion in man. M Epstein, D S Pins, R Arrington, A G Denunzio, and R Engstrom (U S Veterans Administration Hospital, Miami, University, Miami, Fla.) *Journal of Applied Physiology*, vol 39, July 1975, p 66-70 26 refs Research supported by the U S Veterans Administration and Hoechst Pharmaceutical Co., Grants No NGR-10-007-097, No NIH-RR-261

The study compares the natriuresis induced by head-out water immersion to that of a standard saline infusion and assesses the relative effectiveness of these two techniques as volume determinants of renal sodium and water handling in humans in a seated posture The data obtained show that the volume stimulus of immersion is identical to that of standard saline-induced extracellular fluid volume expansion (ECVE) in normal seated subjects The ability of head-out water immersion to induce a natriuresis without a concomitant increase in total blood volume and with a decrease in body weight suggests that water immersion may be preferred as an investigative tool for assessing the effects of ECVE in man S.D

A75-41396 Effect of changes in arterial oxygen content on circulation and physical performance B Ekblom, R Huot, E M Stein, and A T Thorstensson (Gymnastik- och Idrottshogskolan, Stockholm, Sweden) *Journal of Applied Physiology*, vol 39, July 1975, p 71-75 36 refs Research supported by the Research Council of the Swedish Sports Federation and City University of New York

The objective of the present study was to assess the circulatory response to submaximum and maximum exercise in the same subject at different levels of arterial oxygen content Nine subjects exercised under three different experimental conditions (1) breathing room air (control), (2) breathing 50% oxygen (hyperoxia), and (3) after rebreathing a carbon monoxide gas mixture (hypoxia) It was found that oxygen content in the arterial blood differed significantly from control values during hypoxia and hyperoxia experiments Maximum oxygen consumption was substantially higher in hyperoxia and considerably lower in hypoxia than in the control experiment A correlation was found between maximum oxygen consumption and transported oxygen, which suggests that central circulation is an important limiting factor for human maximum aerobic power A lower lactate concentration during submaximal exercise in the hyperoxia experiments may be indicative of a higher aerobic energy yield, especially at the beginning of exercise Physical performance varied directly with maximum oxygen consumption S D

A75-41397 Effect of sojourn at 4,300 m altitude on electroencephalogram and visual evoked response H V Forster, R J. Soto, J A Dempsey, and M J Hosko (Wisconsin, Medical College, Milwaukee, Wis.) *Journal of Applied Physiology*, vol 39, July 1975, p 109-113 13 refs Army-supported research, Grant No NIH-1-ROI-HL-15469-01

The purpose of this study is to determine whether chronic (more than one day) hypoxia could induce changes in the electrical activity of the brain at levels of oxygenation which cause no change during acute exposure Electroencephalographic (EEG) and visual evoked responses (VER) are recorded from 7 male sea-level residents during a 9-12 sojourn at 4,300 m altitude under specified conditions Experimental findings corroborate the hypothesis that certain behavioral and physiological changes caused by a stay at a high altitude could be due to alterations in the function of the central nervous system in man S D

A75-41414 # Improving cockpits through crew workload measurement E L Brown, G Stone, and W E Pearce (Douglas Aircraft Co , Long Beach, Calif) In Advanced Aircrew Display Symposium, 2nd, Patuxent River, Md , April 23, 24, 1975, Proceedings Patuxent River, Md , U S Naval Air Systems Command, Naval Air Test Center, 1975, p 370-376

A computerized method of analyzing flight crew workload (FCW) for a particular cockpit design is presented. It is based on a typical flight mission scenario constructed to explore the expected operational envelope and to exercise a major portion of the aircraft displays, controls, and systems in a sequence and time frame typical of the more demanding operations planned The technique concentrates on design factors under the control of crew station designers and provides for quick and low-cost iteration of alternatives It obtains workload relative to specific equipment and systems, permitting special attention to be given to high-workload items during the early development of concepts and hardware before simulation is available FCW is taken to be the ratio of time required to time available for performance, following Wingert's definition (1972) S J M

A75-41440 * The influence of man in space observations T E Hanes (NASA, Washington, D C.) In Skylab science experiments, Proceedings of the Symposium, San Francisco, Calif , February 28, 1974 Tarzana, Calif , American Astronautical Society, 1975, p 65-70

The paper evaluates the Skylab missions from the viewpoint of to what extent the presence of men may have been a detriment to scientific observations, either through their movements or through contamination of the spacecraft and instruments The stability of the instrument canister within the Apollo Telescope Mount was secured by the Experiment Pointing Control System Angular stability was specified to be within plus or minus 2 5 arc seconds, and was found to be less than 2 arc seconds during normal crew activity No astronomical observations were reported as being degraded by crew movements Instrumentation was installed to measure rates of contaminant particle deposition on optical surfaces Clouds were formed from particles originating in outgassing from vehicle surface materials and from vent apertures The Coronograph Contamination Measurement Instrument was used to measure the brightness of the induced cloud surrounding Skylab Preliminary analysis shows no significant degradation of photographic data attributable to contamination P T H

A75-41441 * The response of single human cells to zero gravity. P O Montgomery, Jr , J E Cook, R C Reynolds, J S Paul, L Hayflick, W W Schulz, D Stock, S Kinzey, T Rogers, and D Campbell (Woodlawn Hospital, Texas, University, Dallas, M D Anderson Hospital, NASA, Johnson Space Center, Houston, Tex , Stanford University, Palo Alto, Calif) In Skylab science experiments, Proceedings of the Symposium, San Francisco, Calif , February 28, 1974 Tarzana, Calif , American Astronautical Society, 1975, p 71-97 32 refs Contract No NAS9-5110, Grant No NGR-44-012-003

Twenty separate cultures of Wistar-38 human embryonic lung cells were exposed to a zero-gravity environment on Skylab for periods of time ranging from one to 59 days Duplicate cultures were run concurrently as ground controls Ten cultures were fixed on board the satellite during the first 12 days of flight Growth curves, DNA microspectrophotometry, phase microscopy, and ultrastructural studies of the fixed cells revealed no effects of a zero-gravity environment on the ten cultures Two cultures were photographed with phase time lapse cinematography during the first 27 days of flight No differences were found in mitotic index, cell cycle, and migration between the flight and control cells Eight cultures were returned to earth in an incubated state Karyotyping and chromosome banding tests show no differences between the flight and control cells P T H

A75-41442 * Vestibular side effects in the orbital stage of Skylab II and III missions A Graybiel, E F Miller, II (U S Naval Aerospace Medical Research Laboratory, Pensacola, Fla), and J L Homick (NASA, Johnson Space Center, Biomedical Research Office, Houston, Tex) In Skylab science experiments, Proceedings of the Symposium, San Francisco, Calif , February 28, 1974 Tarzana, Calif , American Astronautical Society, 1975, p 99-115 11 refs

None of the six astronauts were motion sick when tested (on or after Mission Day 8) in the workshop under experimental conditions which elicited motion sickness preflight and postflight Skylab III but not Skylab II astronauts experienced motion sickness under operational conditions aloft There were individual differences in the severity of the symptoms and susceptibility to motion sickness persisted for three to five days The discussion centers around the reasons for the greater susceptibility to motion sickness under operational than experimental conditions aloft and the implication of Skylab findings for future manned space missions (Author)

A75-41443 * Skylab medical contributions and significance to manned space flight C A Berry (NASA, Washington, D C) In Skylab science experiments, Proceedings of the Symposium, San Francisco, Calif , February 28, 1974 Tarzana, Calif , American Astronautical Society, 1975, p 117-126

A75-41449 * Stimulus novelty, task relevance and the visual evoked potential in man E Courchesne, S A Hillyard, and R Galambos (California, University, La Jolla, Calif) *Electroencephalography and Clinical Neurophysiology,* vol 39, Aug 1975, p 131-143 23 refs Grants No NGR-05-009-198, No NIH-1-R01-MH-25594

The visual evoked potential (VEP) to rare, task-relevant (counted) numerical stimuli was compared with VEPs to rare, task-irrelevant stimuli, both being randomly interspersed within a sequence of tachistoscopically-flashed background numbers These task-irrelevant stimuli were of two classes (1) easily recognizable (e g , simple geometric shapes) and (2) completely novel (i e , complex, colorful abstract-type drawings which were unrecognizable) It was found that such novel stimuli did, in fact, evoke large P3 waves, but they had different scalp distributions from those which followed the task-relevant stimuli This indicates that at least two types of late positive P3 waves exist, differing both in brain source and psychological correlates S J M

A75-41457 Head movement induced by angular oscillation of the body in the pitch and roll axes. G R Barnes and B H Rance (RAF, Institute of Aviation Medicine, Farnborough, Hants , England) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 987-993 9 refs

The transmission of angular acceleration to the head of a human subject has been investigated during sinusoidal angular oscillation of the body in either pitch or roll about an axis through the upper lumbar vertebrae The results indicated that angular acceleration of the skull was induced in all three axes of the head by both pitch and by roll motion At frequencies below 1 to 2 Hz the head moved with the body, but in the frequency range from 2 to 8 Hz, the amplitude of head acceleration was augmented, indicating that oscillation about a center of rotation low in the body may induce large angular movements in this frequency range because of the linear component of acceleration delivered at the cervical vertebrae At higher

frequencies, the acceleration at the head was attenuated with an associated increase in phase lag, probably due to the absorption of input acceleration by the upper torso. (Author)

A75-41458 Considerations of vision and cerebral function during hypotension. A N Nicholson (RAF, Institute of Aviation Medicine, Farnborough, Hants, England) *Aviation, Space, and Environmental Medicine*, vol 46, Aug. 1975, p 996-999 34 refs

The currently held theory of preserved consciousness with impaired vision during positive acceleration is based on a maintained intraocular pressure and selective impairment of conduction in the peripheral visual pathway, though the experimental evidence does not wholly support this theory During hypotension, intraocular pressure closely follows the arterial pressure, and conduction along the optic nerve is preserved as long as the electroretinogram persists It is proposed that, though the mechanism of visual impairment during hypotension is related to events in the peripheral visual pathway, there are likely to be active forebrain events which preserve consciousness (Author)

A75-41459 * Volatile organic components in the Skylab 4 spacecraft atmosphere H M Liebich, W Bertsch, A Zlatkis, and H J Schneider (Medizinische Universitatsklinik, Tubingen, West Germany, Houston, University, NASA, Johnson Space Center, Life Sciences Directorate, Houston, Tex.) *Aviation, Space, and Environmental Medicine*, vol 46, Aug 1975, p 1002 1007 9 refs Contract No NAS9-13457

The volatile organic components in the spacecraft cabin atmosphere of Skylab 4 were trapped on a solid adsorbent at various times during the mission In post-flight analyses, more than 300 compounds in concentrations from less than 1 ppb up to 8000 ppb could be detected by high-resolution gas chromatography In the samples of the 11th, 47th, and 77th day of the mission, approximately 100 components in the molecular weight range from 58 to 592 were identified by mass spectrometry Besides components known from other environments, such as alkanes, alkenes, and alkylated aromatic hydrocarbons, components typical of the human metabolism, such as ketones and alcohols, were found Other typical components in the spacecraft atmosphere included fluorocarbons and various silicone compounds, mostly normal and cyclic methylsiloxanes (Author)

A75-41460 Some effects of alcohol on various aspects of oculomotor control. F E. Guedry, Jr., R D Gilson, D J Schroeder, and W. E Collins (U S Naval Aerospace Medical Research Laboratory, Pensacola, Fla.) *Aviation, Space, and Environmental Medicine*, vol 46, Aug 1975, p 1008-1013 31 refs FAA-Army-Navy-sponsored research.

Recent studies have shown that alcohol interferes with visual control of vestibular nystagmus The present study was designed to assess three partially independent systems of oculomotor control Performance on three tasks was measured before and after mild alcohol dosage One task involved visual suppression of vestibular nystagmus, a second involved smooth oculomotor tracking of a moving target, and a third required repetitive rapid voluntary shifts in gaze Oculomotor control was degraded on the first two tasks with recovery toward the initial performance level 4 hr after drinking Performance on the third task was not obviously degraded, although it is possible that improvement with practice was retarded Results are discussed in terms of neurological systems involved and kinds of flight tasks potentially affected (Author)

A75-41461 Use of the invariant method of speech analysis to discern the emotional state of announcers P. V Simonov, M V. Frolov, and V L. Taubkin (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) *Aviation, Space, and Environmental Medicine*, vol 46, Aug 1975, p 1014-1016 5 refs.

An improved method is described for discerning emotional coloring of speech on the frequency of the main tone and the average number of intersections at zero level within the range of first formant frequencies Vowels from words pronounced by announcers in different emotional states served as material for experiments The method was elaborated in experiments with actors and drama-school undergraduates and then tested under natural conditions on amateur parachute jumpers (Author)

A75-41462 Effect of labyrinthectomy on the dynamic vestibulo-ocular counterroll reflex in the Rhesus monkey. K A Smiles, D Hite, V J Hyams, and A. M Junker (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, Ohio) *Aviation, Space, and Environmental Medicine*, vol 46, Aug 1975, p 1017-1022 11 refs

Timeline records of eyeball counterrotation to constant speed rotations about the line of sight were examined in the Rhesus monkey via a linear-transformer measurement system using a contact lens Normal monkeys exhibited a decrease in the amplitude ratio of eye-to-chair motion and an increasing phase lag between eye and chair as the frequency of the motion platform increased Bilateral labyrinthectomy or prolonged dosage with streptomycin was found nearly to abolish the counterroll reflex Unilateral damage to the vestibular system resulted in a decrease in the amplitude ratio of the eye-to-chair motion by approximately 50% one month after surgery (Author)

A75-41463 Investigation of human cerebral circulation in spaceflight conditions Iu E Moskalenko, G B Veinshtein, and V N Semernia (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR) *Aviation, Space, and Environmental Medicine*, vol 46, Aug 1975, p 1023-1026 10 refs

The available experimental evidence on the functional characteristics of cerebral circulation indicates that this circulatory system is readily affected by such dynamic spaceflight factors as acceleration and zero-g A schematic diagram is proposed for a computer-aided investigation of cerebral circulation Three groups of parameters should be recorded parameters for the extrinsic influences on the system (inputs of the system), parameters for the efficiency of the system under functional loading (output of the system), and parameters for the system state during functional loading (changes in cerebrovascular resistance) Reported results suggest that rheoencephalography may be considered an informative technique for dynamic evaluation of changes in the cerebral circulation system under dynamic spaceflight factors Rheoencephalography is found to be a relatively accurate means of evaluating the regulatory capacity of the system, while providing indirect information about changes in systemic circulation The information yielded by rheoencephalography could be increased by determining correlations between this and other techniques for a quantitative evaluation of cerebral circulation S D

A75-41464 Differences between seated and recumbent resting measurements of auscultative blood pressure M T Lategola and D E Busby (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.) *Aviation, Space, and Environmental Medicine*, vol 46, Aug. 1975, p. 1027-1029 13 refs

Blood pressure measurements were made on 100 male subjects between 20 and 60 years of age in order to determine the influence of testing position (recumbent or seated) on the value obtained For the total group, the average systolic and diastolic pressures were 6 6 and 0.8 mm Hg higher, respectively, in the recumbent position than in the sitting position The usual value of clinical error obviates the practical application of these findings, however, since it is usually about 2 mm Hg. S.J.M

A75-41465 Toxicological findings in fatal civil aviation accidents, fiscal years 1968-1974 D J Lacefield, P A. Roberts, and C W Blossom (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.). *Aviation, Space, and Environmental Medicine*, vol. 46, Aug 1975, p 1030-1032 5 refs.

Toxicological findings in 1,345 fatal general-aviation accidents from fiscal year 1968 through 1974 are summarized Methods used in examination of specimens for alcohol, drugs, carbon monoxide, cyanide, and cholinesterase activity are described Blood ethanol levels in excess of 0 050% were found in 117 of the 1,345 pilots (8 7%) Drugs were found in 16 cases (1 2%) These and other toxicological findings indicate that in more than 40% of the cases, information worthy of consideration in developing the human-factor history of an accident or the cause of death from survivable crashes was obtained (Author)

A75-41466 Levels of whole-body vibration affecting human vision M J Griffin (Southampton, University, Southampton, England) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1033-1040 30 refs

The current study was conducted to determine the levels of whole-body vibration that will impair visual acuity The blur levels for individual subjects suggest that whole-body vibration of the type employed in the experiment causes the eye to move relative to the head The extent of this effect and the way it depends on vibration frequency appear to vary greatly from person to person It is thus recommended that these results be considered as providing interim guidance while an advance in understanding of other variables in the individual subject proceeds S J M

A75-41467 Association of aircraft noise stress to periodontal disease in aircrew members B S Haskell (Pittsburgh, University, Pittsburgh, Pa) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1041-1043 19 refs

It is known that persons professionally exposed to noise are subject to cardiovascular stress severe enough to cause pathology In order to test the possibility that noise stress contributes to periodontal bone loss in humans, an experiment was conducted to assess the degree of alveolar loss in jet fighter pilots and propeller-driven aircraft pilots and crew subjected to aviation noise stress The control group included men not exposed to aircraft noise An analysis of full-mouth radiographs reveals that the greatest amount of bone loss occurred in crew members of propeller-driven aircraft The results suggest that there is a degree of alveolar bone loss over a period of years associated with propeller aircraft noise and that there is negligible noise in the case of jet aircraft noise S D

A75-41468 Serum urate and cholesterol levels in Air Force Academy Cadets D A Clark, E L Arnold, E L Foulds, Jr , D M Brown, D R Eastmead, and E M Parry (USAF, School of Aerospace Medicine, Brooks AFB, Tex , U S Air Force Academy, Colorado Springs, Colo) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1044-1048 21 refs

Studies were conducted to determine the psychological correlates of elevated serum urate and cholesterol levels Elevations of uric acid level appeared to reflect stress that excited fear or insecurity, while high cholesterol levels seemed to reflect a stress which the individual perceived as requiring a sustained increase in physical and/or mental performance S J M

A75-41469 * Hemodynamics, renal function, plasma renin, and aldosterone in man after 5 to 14 days of bedrest G A Melada, R H Goldman, J A Luetscher, and P. G Zager (Stanford University, Stanford, Calif) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1049-1055 25 refs Grants No NGR-05-020-456, No NIH-HL-13917

Continuous bedrest for 5 to 14 days had no significant effect on resting heart rate, blood pressure, or cardiac output in six normal men Head-up tilt induced greater tachycardia in 5 of 6 patients after bed rest than in the control period Propranolol diminished both tachycardia and the incidence of hypotension and faintness in upright posture Plasma volume fell, extracellular fluid volume increased, and plasma renin activity was significantly elevated following bedrest Unusually large increases in plasma renin followed head-up tilt or administration of isoproterenol during bedrest and after resuming normal activity During bedrest, plasma aldosterone was often increased in the early morning It is concluded that after bedrest, upright posture evokes strong beta-adrenergic activity as well as exaggerated metabolic and circulatory responses which can be reduced or abolished by the beta-adrenergic blocker, propranolol (Author)

A75-41470 Normal values and commonly used echocardiographic formulae for adults M R Longo, Jr , A W Guzman, and J H Triebwasser (USAF, School of Aerospace Medicine, Brooks AFB, Tex) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1062-1064 33 refs

A75-41471 Management of severe decompression sickness with treatment ancillary to recompression - Case report. E P Kindwall and I. Margolis (St Luke's Hospital, Milwaukee, Wis) *Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1065-1068 7 refs

Recompression remains the primary form of treatment in decompression sickness, but severe cases require ancillary treatment The case of a compressed-air worker with decompression sickness is presented where, in addition to recompression, the victim required 5 5 liters of intravenous fluids in the first 8 hr, heparin, digitalis, steroids, and respiratory support to prevent death The report includes a description of the precipitating causes, the course during recompression, the drugs and dosages used, and comments on respirator treatment (Author)

A75-41472 Medical aspects of supersonic travel F S Preston (British Airways Medical Service, Hounslow, Middx , England) *(Australian and New Zealand Aviation Medical Society Meeting, Rotorua, New Zealand, Sept 1974) Aviation, Space, and Environmental Medicine,* vol 46, Aug 1975, p 1074-1078 21 refs

Some medical problems associated with high-altitude long-range supersonic travel in the Concorde aircraft are examined High-altitude exposure is discussed in terms of oxygen supply, where pressure breathing must be used above 12,200 m in order to maintain consciousness Cabin altitude relative to probable failure over flying hours is examined along with a special one-handed quick-donning aircrew mask and a conventional drop-down mask for the passengers The effects of atmospheric ozone, thermal environment, cosmic radiation, and aircraft noise on in-flight persons are evaluated Requirements for a safe supersonic travel are set forth S D

A75-41499 * Fulminating arterial hypertension with pulmonary edema from release of adrenomedullary catecholamines after lesions of the anterior hypothalamus in the rat M A Nathan and D J Reis (Cornell University, New York, N Y) *Circulation Research,* vol 37, Aug 1975, p 226-235 32 refs Research supported by the Harris Foundation, Grants No NIH-NS-03346, No NGR-33-010-179

A75-41500 * Reduced baroreflex sensitivity with volume loading in conscious dogs. S F Vatner, D H Boettcher, G R Heyndrickx, and R J McRitchie *Circulation Research,* vol 37, Aug 1975, p 236-242 24 refs NASA-supported research, Grants No NIH-HL-15416, No NIH-HL-1043609

Results of studies of the Bainbridge reflex in intact conscious dogs are presented They indicate that arterial baroreflex sensitivity is reduced progressively as atrial pressure is raised by volume loading, this observation explains how heart rate can rise markedly in the presence of an elevated arterial blood pressure S J M

A75-41609 The conduction of the cardiac impulse· The slow response and cardiac arrhythmias P F Cranefield (Rockefeller University, New York, N Y) Mount Kisco, N Y , Futura Publishing Co , 1975 412 p 435 refs $27 50

The present work discusses several physiological aspects of the heart related to cardiac potential action and conduction in fibers of diminished excitability A fundamental thesis is that heart fibers produce two essentially different kinds of potential action a fast response and a slow response The ways in which spontaneous and

triggered rhythmic activity can arise in discrete foci of depolarized fibers are examined Some of the most common arrhythmias are analyzed to show how they may arise from known abnormalities at the cellular level In particular, most arrhythmias result either from slow conduction or rhythmic activity in a localized area of cells characterized by slow response activity alone Also discussed are the circus movement of excitation and the effects of various anti-arrhythmic drugs in current use S D

A75-41700 * Ultraviolet-gas phase and -photocatalytic synthesis from CO and NH3. J S Hubbard, G E Voecks, G L. Hobby (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif), J P Ferris, E A Williams, and D E Nicodem (Rensselaer Polytechnic Institute, Troy, N Y) *Journal of Molecular Evolution,* vol 5, Aug 5, 1975, p 223-241 35 refs Grants No NGR-33-018-148, No NGR-05-002-308

Ammonium cyanate is identified as the major product of the photolysis of gaseous NH3-CO mixtures at 206 2 or 184 9 nm Lesser amounts of urea, biurea, biuret semicarbazide, formamide and cyanide are observed A series of 18 reactions underlying the formation of photolysis products is presented and discussed Photocatalytic syntheses of C-14-urea, -formamide, and -formaldehyde are carried out through irradiation of (C-14)O and NH3 in the presence of Vycor, silica gel, or volcanic ash shale surfaces The possible contributions of the relevant reactions to the abiotic synthesis of organic nitrogen compounds on Mars, the primitive earth, and in interstellar space are examined S D

A75-41751 Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Edited by H H Kornhuber (Ulm, Universitat, Ulm, West Germany) Berlin, Springer-Verlag (Handbook of Sensory Physiology Volume 6, pt 2), 1974 687 p $102 10

An explanatory treatment of various aspects of vestibular system function is given, with emphasis on inimical effects of the organs during abnormal stimulation and on the consequences of lesions to them Topics discussed include optic-vestibular orientation to the vertical, nystagmus and related phenomena in man an outline of otoneurology, measurement of vestibulospinal responses in man, vestibular ataxia and its measurement in man, habituation of vestibular responses with and without visual stimulation, motion sickness - etiology and autonomic effects, and characteristics of vestibular neurons after acute and chronic labyrinthine destruction S J M

A75-41752 Psychophysics of vestibular sensation F E Guedry, Jr (U S Naval Aerospace Medical Center, Pensacola, Fla) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 3-154 464 refs

The subjective perceptual and adaptive aspects of vestibular response are investigated Notational conventions used to describe head motion are explained, and the nature of intravestibular and visual-vestibular interactions is clarified Some of the specific topics considered are the oculogyral effect and the somatogyral effect, thresholds of perception of angular acceleration, indications of adaptation during prolonged stimulation, effects of attenuated vestibular and nonvestibular cues on responses attributed to otolith function, detection of wobble during constant-speed off-vertical rotation, and canal-otolith interactions during Coriolis cross-coupling - S J M

A75-41753 Optic-vestibular orientation to the vertical N Bischof (California Institute of Technology, Pasadena, Calif) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 155-190 155 refs

Three functional principles or types of information processing involved in orientational activity are discussed, namely compensation, reconstruction, and correction Aspects of vertical constancy maintenance considered include external and internal compensation, allowance for compensatory errors, postural direction cues, visual direction cues, feed-forward and feedback compensation, optic-vestibular equivalence, error detection and correction, and determinants of the optic-vestibular weight ratio Emphasis is placed on perceptual space transformations rather than postural equilibrium responses S J M

A75-41754 Nystagmus and related phenomena in man - An outline of otoneurology H H Kornhuber (Ulm, Universitat, Ulm, West Germany) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 193-232 98 refs

Symptomatic and pathological vestibular phenomena are described The main categories of such phenomena discussed are vertigo, nystagmus, gaze paralysis, induced vestibular responses, and otoneurology There are three main types of vestibular vertigo continuous (long-lasting) vertigo, attacks of vertigo, and positional vertigo There are also three kinds of pathological nystagmus spontaneous nystagmus, gaze nystagmus, and fixation nystagmus Vestibular responses such as nystagmus can be induced by caloric (thermal), galvanic, or rotatory (angular acceleratory) stimulation Vestibular oculomotor symptoms can be classified as peripheral, peripheral and central, or central alone Topical diagnosis can be assisted by otoneurological findings, but etiological diagnosis can be made only in the case of congenital nystagmus S J M

A75-41755 * Measurement of otolith function in man A Graybiel (U S Naval Aerospace Medical Center, Pensacola, Fla) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 233-266 71 refs NASA Order T-81633, NASA Order L-43518

Experimental methods used to study the isolated role of the otolithic system and clinical findings contributing to the understanding of this role are considered The abolition of gravitational stimulus in the Skylab orbital flights and the reduced-gravity environment of the moon during Apollo landings have provided unique opportunities for investigation of the otolith Difficulties inherent in this study include the manipulation of stimuli to the otolithic receptors and the eliciting of specific quantifiable responses, while taking into account the roles played by other sensory systems, particularly the canalicular and visual systems There are more obstacles to determining otolithic enhancement of behavioral performance than to determining otolith-based decrements in performance The role played by components of the somatosensory system serving touch, pressure, and kinesthesis (TPK systems) is also significant in exploration of otolith function S J M

A75-41756 Measurement of vestibulo-spinal responses in man. E Peitersen (Rigshospitalet, Copenhagen, Denmark) In Vestibular system Part 2 Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 267-280 66 refs

Measurement of spinal reactions demonstrable by changes in position and of movements caused by labyrinthine stimulation, as those elicited in the head and neck, upper limbs, trunk, and lower limbs, is discussed The most important reflexes are in the upper and lower limbs Reactions to sudden tipping of a couch or platform are also mentioned, persons with destroyed labyrinths are unable to keep their balance without the aid of vision when the tipping table is tilted Central to the discussion is the fact that the effect of vestibular stimulation upon the spinal cord consists in an increase of extensor tonus and a decrease of flexor tonus, i e , facilitation of the antigravity muscles S J M

A75-41757 Modification of the response to angular accelerations by linear accelerations A J Benson (RAF, Institute of Aviation Medicine, Farnborough, Hants , England) In Vestibular system Part 2 - Psychophysics, applied aspects, and general

interpretations Berlin, Springer-Verlag, 1974, p 281-320 137 refs

The vestibular response to large combined linear and angular accelerations, such as those encountered during travel in man-made transportation vehicles, is described Topics considered under this heading include linear acceleratory stimulation of the ampullar receptors, the effect of the acceleration of gravity on responses to rotation, the suppression mechanism, the effect of sustained weightlessness and supragravity accelerations on rotation responses, positional alcohol nystagmus, and the effect of time-varying linear accelerations There is uncertainty about which end-organs are stimulated and about the way in which the afferent signals are processed and integrated with the central nervous system S J M

A75-41758 * Vestibular ataxia and its measurement in man. A R Fregly (U S Naval Aerospace Medical Laboratory, Pensacola, Fla) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 321-360 227 refs NASA Order R-37, NASA Order R-93

Methods involved in and results obtained with a new comprehensive ataxia test battery are described, and definitions of spontaneous and induced vestibular ataxia in man are given in terms of these findings In addition, the topic of alcohol-induced ataxia in relation to labyrinth function is investigated Items in the test battery comprise a sharpened Romberg test, in which the subject stands on the floor with eyes closed and arms folded against his chest, feet heel-to-toe, for 60 seconds, an eyes-open walking test, an *eyes-open standing test, an eyes-closed standing test, an eyes-closed* on-leg standing test, an eyes-closed walk a line test, an eyes-closed heel-to-toe walking test, and supplementary ataxia tests such as the classical Romberg test S J M

A75-41759 Arousal and vestibular habituation W E Collins (FAA, Psychology Laboratory, Oklahoma City, Okla) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 361-368 62 refs

Factors influencing the stimulation and suppression of nystagmus, especially in an adaptive situation, are reviewed The effect of instructions regarding mental activity, such as reverie, *mental arithmetic, mental estimation of auditory stimulus times,* etc , on nystagmic reactions is described The greater the mental activity, the stronger and more regular the nystagmus Most of the tests discussed were given to the subject with his eyes open in total darkness S J M

A75-41760 Habituation of vestibular responses with and without visual stimulation W E Collins (FAA, Psychology Laboratory, Oklahoma City, Okla) In Vestibular system Part 2 Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 369-388 122 refs

Data on habituation to abnormal vestibular stimulation in animals and humans is reviewed in an attempt to clarify the *mechanism underlying this habituation Nystagmic reactions are* examined in animals, while nystagmus, subjective reactions, the oculogyral illusion, and central factors are analyzed in man It is concluded that what was thought to be merely a dropping out of responses (response reduction) is more likely an active process involving the development of opposing responses which inhibit the original responses Moreover, there are considerable differences between responses in animals and in humans S J M

A75-41761 Motion sickness I - Aetiology and autonomic effects II - Some sensory aspects W H Johnson (Toronto, University, Toronto, Canada) and L B W Jongkees (Amsterdam, Universiteit, Amsterdam, Netherlands) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 389-411 99 refs

Etiology and autonomic effects, as well as sensory aspects, involved in motion sickness are considered Linear motion and angular motion are the primary causes of kinetosis, autonomic effects of motion sickness include vascular changes (increased blood flow in the muscles accompanied by vasoconstriction in the skin), perspiration, salivation, hyperventilation, gastrointestinal effects (anorexia), *yawning and sleepiness, effects on vision, and increased* renal absorption of water Sensory aspects investigated feature sensation cupulograms, in hypersensitivity to seasickness, the inclination of the sensation curves is very steep and nearly parallel to the nystagmus curves S J M

A75-41762 Pathology of vestibular sensation L B W Jongkees (Amsterdam, Universiteit, Amsterdam, Netherlands) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 413-450 171 refs

The function of the vestibular organ (otolith and semicircular canals) under linear and angular accelerations is analyzed, especially as regards 'abnormal' sensations caused by unphysiological stimuli The specific stimuli (appropriate stimuli, or stimuli eliciting a specialized organ-filtered response) of the vestibular organs, adaptation and pattern-building, the vestibular sensation and its clinical value in rotation tests, positional and positioning vertigo, spontaneous vertigo, and the nosology of vertigo are discussed Vertigo *can be classified as paroxysmal (consisting of attacks separated by* normal intervals), acute (starting abruptly and thereafter diminishing gradually), or chronic (less severe but continuing over a long period and often periodic in intensity) The vestibular apparatus is seen as a sense organ in its own right, on a par with sight, hearing, smell, taste, and touch S J M

A75-41763 Characteristics of vestibular neurons after acute and chronic labyrinthine destruction W Precht (Max-Planck-Institut fur Hirnforschung, Frankfurt am Main, West Germany) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 451-462 53 refs

Single-neuron studies performed during the process of vestibular compensation are studied, with particular attention to the recovery of vestibularly controlled eye movements Neuronal activity in intact animals is compared to neuronal activity during the acute postoperative stage and over the long term after labyrinthectomy or eighth-nerve neurotomy The data demonstrate the importance of the vestibular nuclei in the compensation process S J M

A75-41764 Compensation of vestibular lesions. K P Schaefer and D L Meyer (Universitats-Nervenklinik, Gottingen, West Germany) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 463-490 130 refs

Results of experiments on various animals to determine the long-term consequences of unilateral and bilateral vestibular lesions are summarized, and the influences of the cerebral cortex, the *cerebellum, the spinal cord, and somato-sensory afferents on* compensatory mechanisms are described In addition, the anamnesis of disorders such as Meniere's syndrome in man is analyzed Of particular interest is the phenomenon of Bechterew compensation, which occurs when the two labyrinths of an animal are destroyed successively at intervals of up to several days In this case a reversal of the direction of lack of tonus (ipsilateral to the first lesion) is observed after the second lesion, indicating adaptation during the interval separating the lesions Furthermore, results show that adjustment consists in a suppression of signals from the intact side after unilateral injury S J M

A75-41765 * A systems concept of the vestibular organs R Mayne (Arizona State University, Tempe, Ariz) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer Verlag, 1974, p

493-580 155 refs Contract No NAS9-4460

A comprehensive model of vestibular organ function is presented The model is based on an analogy with the inertial guidance systems used in navigation Three distinct operations are investigated angular motion sensing, linear motion sensing, and computation These operations correspond to the semicircular canals, the otoliths, and central processing respectively It is especially important for both an inertial guidance system and the vestibular organs to distinguish between attitude with respect to the vertical on the one hand, and linear velocity and displacement on the other The model is applied to various experimental situations and found to be corroborated by them S J M

A75-41766 **The vestibular system and the general motor system** H H Kornhuber (Ulm, Universitat, Ulm, West Germany) In Vestibular system Part 2 - Psychophysics, applied aspects, and general interpretations Berlin, Springer-Verlag, 1974, p 581-620 141 refs

The motor functions controlled by the vestibular organs are summarized Topics discussed include the holding function of the vestibular system (stabilization of body posture and eye position), visual control of the vestibulo-ocular reflex arc via the archicerebellum, rapid phases of nystagmus and saccadic eye movements, the forebrain and the vestibuloreticulocerebellar system, discontinuous (saccadic) function of the cerebellar cortex, function of the cerebellar nuclei, and predictive tracking Special attention is directed towards the psychological consequences of the various mechanisms, particularly as they relate to and contradict Freudian concepts S J M

A75-41825 * **Light-induced leucine transport in Halobacterium halobium envelope vesicles - A chemiosmotic system** R E MacDonald (NASA, Ames Research Center, Biological Adaptation Branch, Moffett Field, Calif , Cornell University, Ithaca, N Y) and J K Lanyi *Biochemistry,* vol 14, no 13, 1975, p 2882-2889 56 refs

A75-41846 **The mental performance of subjects clothed for comfort at two different air temperatures.** D P Wyon (Danmarks Tekniske Hojskole, Lyngby, Denmark, National Swedish Institute for Building Research, Lund, Sweden), P O Fanger, B W Olesen, and C J K Pedersen (Danmarks Tekniske Hojskole, Lyngby, Denmark) *Ergonomics,* vol 18, July 1975, p 359-374 17 refs. Research supported by the Copenhagen General Housing Corp. and National Swedish Institute for Building Research

A study was conducted to determine whether a direct effect of air temperature on alertness and mental performance does exist for male and female subjects (aged 18-25 yr) in thermal comfort with a light and a heavy clothing Performance measures were obtained on a numerical addition task, a recognition memory task, and a test of cue utilization Subjects rated their effort, arousal and fatigue, and air freshness on semantic differential scales Skin temperatures were measured throughout Experimental results showed that the subjects worked equally well under both conditions, although they found the air to be fresher when it was cooler in the cool air/heavy clothing condition Subjective effort, arousal, and fatigue did not differ However, there were significant differences between the air temperatures preferred by male and female subjects V P

A75-41847 **Performance limitations in laterally constrained movements** C G Drury and E B Daniels (New York, State University, Buffalo, N Y) *Ergonomics,* vol 18, July 1975, p 389-395 7 refs

A model of self-paced tracking performance developed earlier (Drury 1971) predicted a linear increase in speed of movement with increases in the width of a course between lateral barriers, except that for very wide courses the speed would be constant at some limiting speed. Three experiments were run to test this hypothesis using the task of drawing along straight courses with a pen-like stylus It was found that the linear portion of the relationship continued up to widths six times those used in the previous study The overall results showed a slow change from the linear portion of the relationship to the flat portion The hypothesis that this was due to the artifact of averaging across subjects was supported by data from the final experiment (Author)

A75-41848 **The effect of warm-up on total oxygen cost of a short treadmill run to exhaustion** E W. Watt (Emory University, Atlanta, Ga) and J L Hodgson (Pennsylvania State University, University Park, Pa) *Ergonomics,* vol 18, July 1975, p 397-401 20 refs Grants No NIH-01748, No NIH-08311

An experimental study was carried out to determine from physiological measurements whether warm-up has any effect on activity demanding sudden all-out exertion Eight male volunteers, aged 20 to 43 years, participated in a 1-min treadmill run to exhaustion Oxygen consumption, heart rate, and respiration rate were recorded every 15 sec during the run and during the first 30 sec of recovery Recovery measurements were made for a total of 30 min It is found that oxygen consumption during the run with warm-up is significantly greater than without warm-up, and that recovery oxygen consumption and total oxygen consumption (run plus recovery) are not significantly different between runs with and without warm-up Heart and respiration rates are found to increase in runs with warm-up A general conclusion is that warm-up is of energetic benefit to the human organism in preparing for a short exhaustive run S D

A75-41849 **Adaptive strategies in vigilance research** E L Wiener and F L Keeler (Miami, University, Coral Gables, Fla) *Ergonomics,* vol 18, July 1975, p 403-414 9 refs Grant No PHS-R01-OH-00346

In an adaptive, or self-adjusting vigilance task, numerous variables combine to define an adaptive strategy, a set of decision rules which govern the adjustments in task difficulty This paper discusses several possible adaptive strategies, particularly variations in the number of scored signals and the amount of change in task difficulty (gain factors) A model by which the signal detection rate can be predicted is developed, and three experiments test the accuracy of this model, and the ability of an adaptive task to hold a constant detection rate over a 48 min vigil (Author)

A75-41850 **Sleep loss effects on movement time** L Buck (National Research Council, Control Systems Laboratory, Ottawa, Canada). *Ergonomics,* vol 18, July 1975, p 415-425 15 refs

Subjects were tested on a subject-paced step-tracking task three times every four hours under both of two regimes one in which they slept for 6 30 hours at night and one in which they remained awake Twelve subjects were tested for two days under each condition, and 8 subjects for three days Reaction times for correct responses increased following sleep loss to an extent inversely related to signal probability Movement times increased following sleep loss to a much greater extent It is concluded that movement time is a more sensitive index of performance deterioration due to sleep loss and that movement time and reaction time represent separate processes (Author)

Page intentionally left blank

Page intentionally left blank

STAR ENTRIES

N75-28670 Virginia Polytechnic Inst and State Univ Blacksburg
THE EFFECT OF HIGH PURITY OXYGEN ON THE ACTIVATED SLEDGE PROCESS Ph D Thesis
Larry David Benefield 1975 208 p
Avail Univ Microfilms Order No 75-15866

The effect of using high purity oxygen as the gas of aeration on the activated sludge process is investigated The gas of aeration was high purity oxygen and compressed air A soluble composition of nutrient broth glucose yeast extract and various mineral salts was used as the substrate Sludge age was used as the control parameter and control was achieved by wasting a specific volume of sludge each day Results indicated that (1) an activated sludge system operating at low solids and high dissolved oxygen concentration is susceptible to takeover by filamentous microorganisms (2) it is not the use of oxygen which is responsible for differences in substrate removal rates and yield observed between air and oxygen activated sludge units Such differences are probably the result of the high solids levels at which most oxygenation systems operate and (3) activated sludge systems when operated under either air or oxygen aeration, will show no significant variation in the gross composition of microbial mass Dissert Abstr

N75-28671 Maryland Univ , College Park
SYNTHESIS OF OPTIMAL PROGRAMMABLE CONTROL POLICIES FOR LUMPED AND DISTRIBUTED PARAMETER REACTOR SYSTEMS Ph D Thesis
Francis Mary Deane 1974 372 p
Avail Univ Microfilms Order No 75-15771

Optimal programmable control policies for various reactor systems were synthesized via Pontryagins Maximum Principle Optimal programmable temperature and pH policies were calculated for the enzymatic hydrolysis of Penicillin G In a cyclically operated reactor optimal periodic control for temperature, pH inlet flow rate and inlet feed rate concentration was also synthesized Optimal bifunctional catalyst composition profiles for a three stage catalytic reformer were synthesized for both isothermal and adiabatic operation For the liquid phase isomerization of xylene, occurring over a zeolite catalyst subject to temperature dependent deactivation, optimal temperature policies were synthesized based on bed position and catalyst age The policies increased yields 20-30% above those obtained at the optimum constant temperature Finally, optimal temperature policies were synthesized for a generalized second order reaction when the catalyst is subject to both temperature and concentration dependent deactivation Dissert Abstr

N75-28672# Joint Publications Research Service Arlington, Va
SPACE BIOLOGY AND AEROSPACE MEDICINE VOLUME 9, NO 3, 1975
O G Gazenko, ed 24 Jul 1975 147 p refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3, 1975 p 3-88
(JPRS-65301) Avail NTIS HC $5 75

The effects of space flight stress on physiological responses of humans, animals and plants are studied

N75-28673 Joint Publications Research Service Arlington Va
AEROSPACE MEDICINE ON THE THIRTIETH ANNIVERSARY OF THE VICTORY OF THE SOVIET PEOPLE IN THE GREAT FATHERLAND WAR
N M Rudnyy *In its* Space Biol and Aerospace Med , Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 1-7 Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9 no 3, 1975 p 3-7

The history of aerospace medicine is outlined for its formation in 1920 up to the present time Achievements in research and development for aviation and astronautics are briefly described G G

N75-28674 Joint Publications Research Service Arlington Va
EXPERIMENT WITH A PHYSIOLOGICALLY ACTIVE CHLORELLA CULTURE ON THE SOYUZ-9 SPACESHIP

E V Moskvitin and E N Vaulina *In its* Space Biol and Aerospace Med Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 8-13 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3 1975 p 7-10

A physiologically active culture of Chlorella was exposed for the first time aboard the Soyuz 9 spacecraft The use of a special front element container made it possible in a single experiment to investigate the effect of spaceflight factors on the cells of algae developing under illumination conditions during the first sixth and fourteenth days In addition, the effect of flight conditions was studied with respect to a Chlorella culture It was found that there is an insignificant change in sensitivity of the cells to the effect of flight factors depending on the duration of their exposure in an active state Author

N75-28675 Joint Publications Research Service Arlington Va
INFLUENCE OF ELECTROCHEMICAL FACTORS ON CULTIVATION OF HYDROGENOMONAS EUTROPHA Z-1 IN AN ELECTROLYTIC CELL
O S Ksenzhek, V M Serebritskiy and V V Vecherova *In its* Space Biol and Aerospace Med , Vol 9, No 3 1975 (JPRS-65301) 24 Jul 1975 p 14-19 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3 1975 p 11-14

The effect of electrode processes on the cultivation of *Hydrogenomonas eutropha Z-1 combined with electrolysis of the* nutrient medium was studied The phenomena occurring at the anode under different conditions of mixing and electrolysis were examined The possibilities of eliminating adverse effects at the anode were determined The behavior of the trace elements precipitating at the cathode and the conditions of their dissolving were investigated Author

N75-28676 Joint Publications Research Service, Arlington, Va
CHANGES IN SOME PHYSIOLOGICAL INDICES IN WHITE RATS UNDER THE INFLUENCE OF ACCELERATIONS UP TO 24 HOURS
V L Popkov *In its* Space Biol and Aerospace Med Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 20-24 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9 no 3, 1975 p 14-17

The physiological effects of prolonged accelerations of 2 and 4 g applied longitudinally and transversely to the long axis of the body of white rats were studied The animals exposed to accelerations for 24 hours exhibited a decrease in the heart rate, respiration rate, rectal temperature, PO2 and pCO2 in the peripheral tissues Author

N75-28677 Joint Publications Research Service, Arlington, Va
SOME AUTONOMIC REACTIONS IN RABBITS EXPOSED TO A PERMANENT MAGNETIC FIELD
L D Klimovskaya and N P Smirnova *In its* Space Biol and Aerospace Med , Vol 9, No 3 1975 (JPRS-65301) 24 Jul 1975 p 25-32 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9, no 3, 1975 p 18-22

Chronic experiments with rabbits have shown that their exposure to a permanent magnetic field of 4 500 oe for three hours causes a transient hypotension, a decrease in the respiratory rate and a tendency to bradycardia Immediately after the exposure the pressor reaction and bradycardia level decrease but by the end of the first day they increase At this time the respiration rate increases in response to the administration of epinephrine, acetyl choline or stimulation of the midbrain reticular formation The exposure does not decrease the compensatory possibilities of the cardiovascular and respiratory systems This follows from their reactions to accelerations of 6 and 10 g Author

N75-28678 Joint Publications Research Service, Arlington Va
COMPARATIVE CHARACTERISTICS OF POLY- AND MONOMER PROTEIN NUTRITION AS APPLICABLE TO SPACE FLIGHTS
V G Vysotskiy *In its* Space Biol and Aerospace Med , Vol 9, No 3, 1975 (JPRS-65301) 24 Jul 1975 p 33-41 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9, no 3, 1975 p 23-28

The use of pure protein mono- and polymers for human nutrition was studied in a 45 day experiment in which 12 test subjects participated The first group of six persons was given casein and the second group an equivalent mixture made of crystalline L-amino acids The first group exhibited no abnormalities in physiological and biochemical functions The second group exhibited marked changes in the body weight losses negative nitrogen balance increase in the ammonia concentration in the urine and exhaled air It appears that amino acid mixtures can be included in human nutrition only after extensive studies Author

N75-28679 Joint Publications Research Service Arlington Va
MODEL OF THE TRANSPORT OF GASES IN PERIODICALLY VENTILATED LUNGS
V G Shabelnikov *In its* Space Biol and Aerospace Med , Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 42-49 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3, 1975 p 28-34

Gas transport in the lungs was studied by mathematical modeling of the effect of discrete pulmonary ventilation, that is, alternation of inhalation and exhalation A qualitative analysis of a system of differential equations describing changes in the composition of air in the alveoli during the breathing cycle demonstrated that at least twice in each respiratory cycle the alveolar air had the ideal composition predicted by the normally continuously ventilated model of the lungs The result pointed to the sum total of possible values of the air composition at different sites of nonuniformly functioning lungs This lung model takes into account the effect of volume concentration of the inert gas in the breathing mixture and the high solubility of CO2 in the blood and pulmonary tissues on pulmonary gas exchange Author

N75-28680 Joint Publications Research Service, Arlington, Va
SOME THEORETICAL ASPECTS OF CONSTRUCTING MEDICAL MONITORING SYSTEMS IN SPACE FLIGHTS

N N Gurovskiy and A D Yegorov *In its* Space Biol and Aerospace Med , Vol 9, No 3, 1975 (JPRS-65301) 24 Jul 1975 p 50-54 Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3, 1975 p 34-37

Theoretical approaches to a medical monitoring system during prolonged space flights are presented by classifying the most probable states occurring during long term weightlessness The main symptoms of these states are described On the basis of this classification the methods and parameters to be used in diagnosis of the symptoms which may occur in space flights are discussed Author

N75-28681 Joint Publications Research Service Arlington, Va
USE OF LENGTHENED AND SHORTENED DAYS ON SPACE FLIGHTS
S I Stepanova *In its* Space Biol and Aerospace Med , Vol 9, No 3, 1975 (JPRS-65301) 24 Jul 1975 p 55-70 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9 no 3, 1975 p 37-48

On the basis of experimental findings and data in the literature it is concluded that a 24-hour day should be recommended for space missions It is assumed that in the future lengthened or shortened days may be used This is confirmed by the hypothesis that the information energy cost of the diurnal cycle is constant Author

N75-28682 Joint Publications Research Service Arlington, Va
HYPOBARIC NITROGEN-OXYGEN ATMOSPHERE AS A METHOD FOR PREVENTING HIGH-ALTITUDE DECOMPRESSION DISEASE
A M Genin, I N Chernyakov, I V Maksimov and V A Glazkova *In its* Space Biol and Aerospace Med Vol 9 No 3 1975 (JPRS-65301) 24 Jul 1975 p 71-76 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9 no 3, 1975 p 48-52

It has been demonstrated experimentally that the development of altitude decompression disease at 250 and 180 mm Hg can be prevented by preliminary desaturation in a nitrogen oxygen hypobaric atmosphere (60% N2 and 40% O2 at 550 mm Hg) This has been demonstrated in 38 experiments with 21 test subjects The use of this atmosphere in space cabins prevents the development of decompression disease upon a decrease in cabin pressure to 250 mm Hg and during activity in a space suit with 180-200 mm Hg outside the ship Author

N75-28683 Joint Publications Research Service, Arlington Va
EFFECT EXERTED ON THE HUMAN AND ANIMAL BODY BY REPEATED EXPOSURE IN A RAREFIED ATMOSPHERE
V G Petrukhin, V G Terentyev, and I N Chernyakov *In its* Space Biol and Aerospace Med Vol 9, No 3, 1975 (JPRS-65301) 24 Jul 1975 p 77-82 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3, 1975 p 53-56

In order to study the chronic form of decompression disease, clinical and physiological examinations of 38 test subjects were carried out They participated in 133 chamber experiments and were exposed to an altitude of 11,000 to 12 000 m for 2 to 3 to 20 to 24 hours after desaturation of different duration In addition histological and histochemical examinations of organs and tissues of three dogs were performed During 70 110 and 140 days the dogs were exposed 20, 33 and 35 times to an altitude of 12,000 m for 2-2 5 hours without preliminary desaturation No persistent pathological changes were found in the animal or human body Author

N75-28684 Joint Publications Research Service Arlington, Va
CHANGES IN INDICES OF THE BLOOD COAGULATING AND ANTICOAGULATING SYSTEM IN FLIGHT CREWS UNDER THE INFLUENCE OF FLIGHT FACTORS
Ye S Nodova *In its* Space Biol and Aerospace Med , Vol 9, No 3, 1975 (JPRS-65301) 24 Jul 1975 p 83-88 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3, 1975 p 56-60

A total of 105 flight qualified crew members in the age group 20 to 40 years were under observation Coagulographic and thromboelastographic parameters of the venous blood were studied The most significant changes (an increase in the coagulation time as related to the time of plasma recalcification a decrease in plasma tolerance to heparin R K, R + K a decrease in the coagulation index SI with respect to the thromboelastogram a significant increase in the fibrinolytic activity and the heparin number) were noted during the postflight period in commanders pilots and navigators Less significant variations in the coagulographic parameters were observed in other crew members These changes can be regarded as the protective-reactive reaction of the anticoagulatory system aimed at reducing hypercoagulation during the emotional stress effect of the flight Author

N75-28685 Joint Publications Research Service Arlington, Va
CHANGE IN ASYMMETRY OF SOME PAIRED FUNCTIONS IN AIRMEN UNDER THE INFLUENCE OF FLIGHT FACTORS
V A Yegorov and V K Shirogorov *In its* Space Biol and Aerospace Med, Vol 9, No 3 1975 (JPRS-65301) 24 Jul 1975 p 89-95 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3, 1975 p 60-64

The flight activity of a pilot brings about peculiar changes in the asymmetry of physiological functions whose pattern is dependent to a large extent on the initial state of asymmetry An in-flight change in the functional state and the interaction of paired structures of the cerebral hemispheres results in a reduction in the predominance of the guiding arm in pilots with distinct preflight asymmetry and an increase in opposite asymmetric fluctuations in pilots with insignificant preflight asymmetry
Author

N75-28686 Joint Publications Research Service, Arlington, Va
PSYCHOPHYSIOLOGICAL CHARACTERISTICS OF THE WORK ACTIVITY OF AN OPERATOR WEARING SPECIAL GEAR
V A Ponomarenko, R I Brusnichkina and N A Fedorov *In its* Space Biol and Aerospace Med Vol 9, No 3 1975 (JPRS-65301) 24 Jul 1975 p 96-102 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow) v 9, no 3 1975 p 64-68

The performance of a suited operator was studied The experiments were carried out in a trainer consisting of a cockpit and electronic model of the plane attitude realized by an electronic analog computer The experiments revealed that a special suit may reduce performance The main reason for this is that under positive pressure the influx of afferent signals is impoverished due to a reduction in the proprioceptive feedback This disturbs the interaction between the optical and motor analyzers In order to increase the performance of a suited pilot it is necessary to ensure maintenance of the optical-proprioceptive relationship
Author

N75-28687 Joint Publications Research Service, Arlington, Va
MAN'S TOLERANCE OF CORIOLIS ACCELERATIONS WITH LOADING OF DIFFERENT MUSCLE GROUPS
G S Ayzikov, M D Yemelyanov, and V G Ovechkin *In its* Space Biol and Aerospace Med Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 103-111 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3 1975 p 69-74

The effect of an arbitrary loading of different muscle groups (shoulders back, legs) and motor acts on the tolerance to Coriolis accelerations was investigated in 140 experiments in which 40 test subjects participated The accelerations were accumulated and simulated by the Bryanov method Muscle tension was accompanied by a less expressed vestibular autonomic reaction and shortening of the recovery period after the development of motion sickness symptoms The greatest changes were observed during the performance of complex motor acts and loading of the shoulder muscles Possible mechanisms of these effects are discussed
Author

N75-28688 Joint Publications Research Service Arlington Va
METHOD FOR COMPUTING THE RADIATION DANGER FROM PROTON SOLAR FLARES
V L Generozov A V Kolomenskiy and V A Sakovich *In its* Space Biol and Aerospace Med Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 112-118 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3 1975 p 74-78

The risk of exceeding established safe levels during manned space flight is computed by considering the stochastic nature of solar flares A model is formulated that considers temporal distribution of flares, a flux distribution and a parameter characterizing the spectrum, as well as functional tissue dose distribution in the astronaut s body with flight duration Results indicate that an increase in flight duration increases the isorisk total flux of protons monotonically with an increase in flux the risk decreases rapidly
G G

N75-28689 Joint Publications Research Service Arlington Va
METHOD FOR REGISTERING MUSCLE EFFORTS OF DOGS IN A CHRONIC EXPERIMENT
V S Oganov, V G Kozlova, A S Rakhmanov, and N G Esaulov *In its* Space Biol and Aerospace Med Vol 9 No 3, 1975 (JPRS-65301) 24 Jul 1975 p 119-123 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3, 1975 p 78-81

The relative change in effort of an gastrocnemius dog muscle in a chronic experiment was studied by monitoring the strain which arises in its tendon in the process of active contraction or dilation of the muscle with an implanted converter Registration of resulting dynamomyograms with different kinematic and dynamic parameters shows a relationship between excitation and contraction processes in the skeletal muscles
G G

N75-28690 Joint Publications Research Service, Arlington, Va
EXPERIMENT WITH CHLORELLA ABOARD THE ZOND-8 AUTOMATIC STATION
E N Vaulina and E V Moskvitin *In its* Space Biol and Aerospace Med Vol 9 No 3 1975 (JPRS-65301) 24 Jul 1975 p 124-128 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3 1975 p 81-83

Space flight condition effects on the dynamic productivity of Chlorella during postflight cultivation are studied by considering variants without irradiation and with postflight irradiation An insignificant lag in culture development for the preflight irradiation case was observed Flight conditions had a negative effect on viability and mutability of unirradiated Chlorella cells however, the differences between experiment and control were statistically unreliable
G G

N75-28691 Joint Publications Research Service Arlington, Va
CYTOPHYSIOLOGICAL CHANGES INDUCED BY SPACE-FLIGHT FACTORS IN THE SEEDS OF SOME CONIFEROUS SPECIES
I N Tretyakova and N V Gerasimenko *In its* Space Biol and Aerospace Med Vol 9 No 3 1975 (JPRS-65301) 24 Jul 1975 p 129-132 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9, no 3 1975 p 83-84

Space flight factors and their influence on growth processes of seeds of the genus Pinus were studied by cytological analyses using the tips of rootlets from germinated seeds Resultant data show that growth processes became more intensive Physicochemical changes in the ribonucleoproteins of cell structures were associated with dissociation of phosphoric acid groups This effect reflects changes in cell metabolism in the direction of an intensification
G G

N75-28692 Joint Publications Research Service Arlington Va
GENESIS OF VESTIBULAR-AUTONOMIC DISORDERS IN SPACEFLIGHT
I I Bryanov E I Matsnev and I Ya Yakovleva *In its* Space Biol and Aerospace Med, Vol 9, No 3 1975 (JPRS-65301) 24 Jul 1975 p 133-140 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3 1975 p 85-88

The mechanism of vestibular autonomic disorder during space flight is analyzed by considering a redistribution of the circulating blood volume during weightlessness and the resultant combination of hemodynamic changes, disturbances in the water mineral metabolism and other functional shifts It is shown that the high sensitivity of the labyrinth to hemodynamic disorders is predetermined by the peculiarities of its blood supply
G G

N75-28693*# Lockheed Electronics Co, Houston Tex Aerospace Systems Div
ELECTRON MICROPROBE ANALYSIS PROGRAM FOR BIOLOGICAL SPECIMENS BIOMAP

Ben F Edwards Jan 1972 113 p refs
(Contract NAS9-12200, Proj 1030)
(NASA-CR-141923, Rept-1E4022) Avail NTIS HC $5 25 CSCL 06B

BIOMAP is a Univac 1108 compatible program which facilitates the electron probe microanalysis of biological specimens Input data are X-ray intensity data from biological samples, the X-ray intensity and composition data from a standard sample and the electron probe operating parameters Outputs are estimates of the weight percentages of the analyzed elements the distribution of these estimates for sets of red blood cells and the probabilities for correlation between elemental concentrations An optional feature statistically estimates the X-ray intensity and residual background of a principal standard relative to a series of standards Author

N75-28694*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
SPACE STATION INTERIOR DESIGN RESULTS OF THE NASA/AIA SPACE STATION INTERIOR NATIONAL DESIGN COMPETITION
Richard F Haines Washington Jul 1975 135 p refs
(NASA-TN-D-8018, A-5867) Avail NTIS HC $5 75 CSCL 22B

The results of the NASA/AIA space station interior national design competition held during 1971 are presented in order to make available to those who work in the architectural engineering and interior design fields the results of this design activity in which the interiors of several space shuttle size modules were designed for optimal habitability Each design entry also includes a final configuration of all modules into a complete space station A brief history of the competition is presented with the competition guidelines and constraints The first place award entry is presented in detail, and specific features from other selected designs are discussed This is followed by a discussion of how some of these design features might be applied to terrestrial as well as space situations Author

N75-28695+ Salpetriere Hospital, Paris (France) Dept de Chirurgie Cardiaque
DEFINITION AND DEVELOPMENT OF AN INFORMATION SYSTEM FOR CARDIAC DISEASE INTENSIVE CARE UNITS Final Report [DEFINITION ET REALISATION D'UN SYSTEME INFORMATIQUE DESTINE A UNE UNITE DE SOINS INTENSIFS CARDIOLOGIQUES]
C Cabrol and F Gremy (Soc TITN) Dec 1973 23 p refs In FRENCH
(Contract DGRST-72-7-0124)
Avail NTIS HC $3 25

A modular patient monitoring system with a dialog input-output facility and a minicomputer was tested Further development includes a rehyphenanimation data bank in connection with a time-sharing computer Arterial pressure and electrocardiograms, ventriculav complexes and arrythenias and internal monitoring are automatically furnished, and manual data can be entered into the system through the dialog terminal ESRO

N75-28696*# Naval Aerospace Medical Research Lab, Pensacola, Fla
MICRODOSIMETRIC STRUCTURE OF HZE PARTICLE TRACKS IN TISSUE
Hermann J Schaefer 8 Apr 1975 22 p refs
(NASA Order W-13280)
(NASA-CR-141935, NAMRL-1214) Avail NTIS HC $3 25 CSCL 06R

Heavy nuclei of the primary galactic radiation in space can have the same linear energy transfer yet greatly different lateral distribution patterns of the energy in the microstructure of tissue Track structure thus presents itself as a new dosimetric parameter for HZE particles which is at present incompletely understood in its radiobiological significance The theory of track structure distinguishes two regions core and penumbra The core is a narrow region with a radius far below 1 micron in tissue where energy deposition occurs mainly through excitations and collective oscillations of electrons Energy density in the core accounts for slightly more than half the total LET The penumbra surrounding the core extends laterally several to many microns depending on the energy of the primary Energy density in the penumbra decreases steeply with the square of increasing radius The relationships are illustrated with nuclear emulsion micrographs and plots of energy density profiles The implications of the findings for a dosimetric system for HZE particles are discussed Author

N75-28697*# California Univ, La Jolla Dept of Neurosciences
BRAINSTEM AUDITORY EVOKED RESPONSES IN MAN 1 EFFECT OF STIMULUS RISE-FALL TIME AND DURATION
Kurt Hecox, Nancy Squires and Robert Galambos [1975] 28 p refs
(Grants NGR-05-009-198, PHS-NS-10482-01)
(NASA-CR-143257) Avail NTIS HC $3 75 CSCL 06P

Short latency (under 10 msec) responses elicited by bursts of white noise were recorded from the scalps of human subjects Response alterations produced by changes in the noise burst duration (on-time), inter-burst interval (off-time) and onset and offset shapes were analyzed The latency of the most prominent response component wave V, was markedly delayed with increases in stimulus rise time but was unaffected by changes in fall time Increases in stimulus duration and therefore in loudness, resulted in a systematic increase in latency This was probably due to response recovery processes since the effect was eliminated with increases in stimulus off-time The amplitude of wave V was insensitive to changes in signal rise and fall times, while increasing signal on-time produced smaller amplitude responses only for sufficiently short off-times It was concluded that wave V of the human auditory brainstem evoked response is solely an onset response Author

N75-28698*# Grambling State Univ, La
LYMPHOID CELL KINETICS UNDER CONTINUOUS LOW DOSE-RATE GAMMA IRRADIATION A COMPARISON STUDY Final Technical Report
Bessie R Foster 31 Jul 1975 39 p refs
(Grant NsG-9014)
(NASA-CR-143262) Avail NTIS HC $3 75 CSCL 06R

A comparison study was conducted of the effects of continuous low dose-rate gamma irradiation on cell population kinetics of lymphoid tissue (white pulp) of the mouse spleen with findings as they relate to the mouse thymus Experimental techniques employed included autoradiography and specific labeling with tritiated thymidine (TdR-(h-3)) The problem studied involved the mechanism of cell proliferation of lymphoid tissue of the mouse spleen and thymus under the stress of continuous irradiation at a dose rate of 10 roentgens (R) per day for 105 days (15 weeks) The aim was to determine whether or not a steady state or near-steady state of cell population could be established for this period of time and what compensatory mechanisms of cell population were involved Author

N75-28699*# Scientific Translation Service, Santa Barbara Calif
NEW MOSCOW HYPERBARIC-OXYGENATION BARO-HOSPITAL
S Yelkina I Mishina, S Tutorskaya, G Lomanov and I Melenevskiy Washington NASA Jul 1975 23 p Transl into ENGLISH from various Russian publications
(Contract NASw-2483)
(NASA-TT-F-16464) Avail NTIS HC $3 25 CSCL 06L

The following studies are presented an operation in the barohospital, high pressure medicine, healing with the pressure chamber, pressure chambers in the clinic, and an operation in the pressure chamber Author

N75-28700# Retina Foundation, Boston, Mass
DESIGN AND CONSTRUCTION OF A WIDE ANGLE OPHTHALMOSCOPE AND CAMERA Final Report, 1 Jun 1973 - 31 May 1974
Oleg Pomerantzeff 24 Jan 1975 15 p
(Contract DADA17-73-C-3144)
(AD-A005038) Avail NTIS CSCL 06/12

The purpose of the project was to design a camera capable of photographing the entire fundus of the eye in a single exposure One of the main design problems was the haze created over the central part of the retinal image by reflections from crystalline lens This problem was solved after termination of the contract GRA

N75-28701# Human Engineering Labs, Aberdeen Proving Ground Md

A DESCRIPTIVE MODEL OF NEGATIVE TTS FROM IMPULSES Final Report

David C Hodge Jan 1975 18 p refs

(AD-A005025, HEL-TN-1-75) Avail NTIS CSCL 05/10

Sometimes hearing thresholds are more sensitive after impulse-noise exposure than before This phenomenon has been called negative TTS (temporary threshold shift) A descriptive model of negative TTS is presented, together with a review of the empirical evidence supporting the model It is suggested that a release from inhibition mechanism may be responsible for the negative TTS phenomenon GRA

N75-28702# Naval Aerospace Medical Research Lab, Pensacola Fla

THE BRIEF VESTIBULAR DISORIENTATION TEST AS AN ASSESSMENT TOOL FOR NON-PILOT AVIATION PERSONNEL

Rosalie K Ambler and Fred E Guedry, Jr 16 Oct 1974 22 p refs

(AD-A004963 NAMRL-1210, USAARL-75-7) Avail NTIS CSCL 06/14

Past research has demonstrated the value of the Brief Vestibular Disorientation Test (BVDT) as a screening tool for student pilots This study is concerned with the extension of this technique for use in assessing the potential Naval Flight Officer (NFO) The rater BVDT procedure was used here, and in addition, a performance task involving a short-term memory task in the auditory mode was introduced in order to measure performance decrement Representative groups of entering NFO students were first administered the performance task under the exact conditions of the previous BVDT procedure, but without rotation After a 2-minute rest period the procedure was repeated with rotation Observer assessments were made during this rotation sequence The results indicate that those students who later failed NFO training exhibited greater performance decrement under rotary conditions as compared to static than did successful students Rater-type BVDT scores also indicated slightly greater sensitivity (0 7 level of significance) to the vestibular stimulus for the failures than for the successes It was concluded that this technique is of value in screening NFO s GRA

N75-28703# Naval Surface Weapons Center, Dahlgren, Va

THE EFFECTS OF HIGH POWER PULSED AND LOW LEVEL CW MICROWAVE RADIATION ON AN OPERANT BEHAVIOR IN RATS

Joseph A Diachenko and William C Milroy Jan 1975 24 p refs

(AD-A004943 NSWC/D L-TR-3230) Avail NTIS CSCL 06/18

The two experiments reported were aimed at studying the effects of pulsed and low-level CW microwave radiation on an operant behavior in rats The subjects were trained to perform a lever pressing response on a DRL schedule (Differential Reinforcement qf Low Rate) and tested immediately after one hour daily exposure to 1, 5, 10, 15 (milliwatts per square cm) power levels at 2,450 MHz while other subjects were exposed 24 Jul 1975 p 133-140 refs Transl into ENGLISH from Kosm Biol Aviakosm Med (Moscow), v 9 no 3 1975 p 85-88

N75-28704# URS/Matrix Co Falls Church Va

EVALUATING MAINTENANCE PERFORMANCE VOLUME 3 THE DEVELOPMENT OF GRAPHIC SYMBOLIC SUBSTITUTES FOR CRITERION REFERENCED JOB TASK PERFORMANCE TESTS FOR ELECTRONIC MAINTENANCE Final Report, 1 Apr 1970 - 28 Jun 1974

Edgar L Shriver and John P Foley Jr Nov 1974 75 p refs (Contracts F33615-70-C-1550 F33615-71-C-1505 AF Proj 1710)

(AD-A005296, AFHRL-TR-74-57-Vol-3) Avail NTIS CSCL 05/9

An in-depth review of the literature reported in AFHRL-TR-74-57(I), of this series of documents strongly reiterated the fact that paper and pencil tests of job knowledge and electronic theory tests have very poor criterion-related or empirical validity with respect to the ability of electronic maintenance men for performing their tasks As a result a battery of criterion referenced Job Task Performance Tests (JTPT) was developed and tried out and results were reported in AFHRL-TR-57(II) The battery included tests for the various job activities performed by electronic maintenance technicians such as checkout, align/adjust remove/replace, soldering use of general and special test equipment and troubleshooting In this report, a battery of symbolic tests was developed including a companion symbolic test for each of the job activities for which a criterion referenced JTPT had previously been developed Based on two limited validations all of the graphic symbolic tests, with the exception of the symbolic test for soldering, indicated sufficient promise to justify further consideration and refinement All of these promising symbolic tests should be given more extensive validations using larger numbers of experienced subjects The validation of any such symbolic test requires the administration of a companion JTPT as a validation criterion As a result, a validation is an expensive process in terms of equipment and experienced manpower The troubleshooting symbolic tests require the most extensive refinement Several suggestions are made for improving their empirical validity GRA

N75-28705# URS/Matrix Co Falls Church, Va

EVALUATING MAINTENANCE PERFORMANCE VOLUME 4 A VIDEO APPROACH TO SYMBOLIC TESTING OF ELECTRONICS MAINTENANCE TASKS Final Report, 30 Apr 1971 - 30 Jun 1973

Edgar L Shriver John F Hayes and William R Hufhand Jul 1974 20 p ref

(Contract F33615-71-C-1505, AF Proj 1710)

(AD-A005297 AFHRL-TR-74-57-Vol-4) Avail NTIS

The volume reports an effort to use the video media as an approach for the preparation of a battery of symbolic tests that would be empirically valid substitutes for criterion referenced Job Task Performance Tests The development and tryout of such criterion referenced tests and promising graphic symbolic substitute tests are reported in previous volumes The graphic symbolic tests require the storage of a large amount of pictorial information which must be searched rapidly for display At the time this video effort was started, no completely satisfactory way had been found for rapidly searching and displaying such information In addition, some dynamic displays would have been desirable for those graphic symbolics whereas all of the original graphic pictorials are static The anticipated results that the video media would provide satisfactory and economical solutions to these problems, did not materialize GRA

N75-28706# Dunlap and Associates, Inc, La Jolla Calif

LONGITUDINAL STUDY OF ENVIRONMENTAL VARIABLES AND AVIATION PERFORMANCE EFFECTIVENESS Final Report

Clyde A Brictson Jan 1975 25 p refs

(Contract N00014-73-C-0053 NR Proj 201-146)

(AD-A005423) Avail NTIS CSCL 06/19

A research program which investigated environmental variables of aviation performance effectiveness is described Physiological, psychological, sleep and performance data were collected in a combat environment to describe and predict the influence of prolonged periods of stress on pilot landing performance Significant predictions of pilot performance from experience, biochemical sleep and mood data were obtained A cross validation of pilot landing performance in a replacement air group environment was successfully carried out but not without substantial shrinkage of the original multiple Rs Finally a description of landing signal officers perceptual skills and their potential relation to the LSO fleet environment is presented along

with implications for Navy implementation Research recommendations and future programs related to environmental psychology are suggested GRA

N75-28707# Human Engineering Labs, Aberdeen Proving Ground Md
HUMAN ENGINEERING LABORATORY HELICOPTER ACQUISITION TEST (HELHAT) Final Report
John A Barnes Sep 1974 228 p refs
(AD-A005559, HEL-TM-20-74) Avail NTIS CSCL 17/8

The U S Army Human Engineering Laboratory conducted a series of flight tests in 1972 (HELHAT I) and 1973 (HELHAT II) in which the low-level target acquisition performances of combat-trained OH-58 and AH-1 helicopter crewmen were measured The stationary targets used were both ordnance and high-visibility box-type targets This study contains all of the data gathered during these tests and also reports on the 25 performance variables measured for each of the 851 recorded target acquisitions These variables were used to form the linear equations which were analyzed by the use of a step-wise multiple-regression technique in order to identify the variables contributing to stationary target acquisition performance There were 831 acquisitions recorded during the low-level route reconnaissance flights flown at above the ground levels of 80 to approximately 400 feet and 20 acquisitions recorded during the six nap-of-the-earth's search reconnaissance flights flown at above the ground levels of 1 to approximately 40 feet GRA

N75-28708# Human Engineering Labs Aberdeen Proving Ground, Md
HUMAN PERFORMANCE CRITERIA FOR MILITARY NOISE EXPOSURE Final Report
David C Hodge and Joseph Mazurczak Jan 1975 25 p refs
(AD-A005026, HEL-TN-2-75) Avail NTIS CSCL 05/10

A new research program is described whose objectives include identification of aural performance requirements of soldiers in tactical situations quantification of the effects of aural acuity deficits on such performance, and development of models to predict the effects of military noise exposure on soldiers' performance It is shown that soldiers need to be able to hear in the 100 Hz to 12 kHz range Hearing losses are usually first observed at 4-6 kHz Speech reception is relatively unaffected by typical hearing loss patterns and can be predicted fairly well from audiometric data Materiel sound detection is unaffected by typical hearing losses Personnel sound detection is probably affected by typical hearing losses, and cannot be predicted from audiometric data The program s current emphasis is on the relation between hearing acuity and high-frequency personnel sound detection A description of the test environment is included GRA

N75-28709# Air Force Inst of Tech Wright-Patterson AFB, Ohio School of Engineering
A STUDY OF PILOT PERFORMANCE DURING A GLIDE-SLOPE APPROACH WHEN RATE INFORMATION IS SUPPLIED VIA THE PERIPHERAL VISION M S Thesis
Ernest L Ener, Jr Dec 1974 92 p refs
(AD-A005284 GE/MA/74D-2) Avail NTIS CSCL 05/10

A presentation is made of the findings of a fixed-base simulation study during which the rate of glide-slope deviation was provided via the peripheral vision to the pilot, while flying a simulated glide-slope approach The method used to supply glide-slope deviation was by the movement of alternating black and white lines displayed in the peripheral vision Pilot performance was measured during glide-slope runs performed without the peripheral display and a comparison made with performance measured during use of the display A presentation is also made of the findings of a simulation involving a second-order critical task GRA

N75-28710# California Univ Los Angeles Lab of Environmental Neurobiology
NEUROPHYSIOLOGICAL ESTIMATES OF HUMAN PERFORMANCE CAPABILITIES IN AEROSPACE SYSTEMS Final Report, 1 Oct 1969 - 30 Sep 1974
W R Adey 27 Jan 1975 46 p refs
(Contract F44620-70-C-0017)
(AD-A005690 Rept-1974A12R, AFOSR-75-0170TR) Avail NTIS CSCL 06/19

The effects of 4 5, 6 0 and 7 0 +Gz acceleration levels on the electroencephalogram (EEG) were collaboratively studied with the USAFSAM At no time did the EEG records suggest a significant impairment of cerebral functions To achieve a separation of muscle and brain signals required development of new filtering methods which resulted in a capability for direct monitoring of brain function during severe physical stress in performing subjects The need for adequate monitoring of diving performance ability resulted in the design of a new system using return-current density techniques A wide range of studies have been conducted on cellular behavior in the visual system, in conditions of sleep and wakefulness anesthesia, and as a concomitant of saccadic eye movements Several studies were conducted on the unrestrained chimpanzee including sleep-wake cycles GRA

N75-28711# California Univ, Los Angeles Lab of Environmental Neurobiology
OPTIMIZING MANPOWER SELECTION Final Report, 1 Jun - 31 Aug 1974
John Hanley 31 Oct 1974 98 p refs
(Contract F44620-73-C-0070, AF Proj 6813)
(AD-A005689 Rept-1974H11, AFOSR-75-0169TR) Avail NTIS CSCL 06/16

Electroencephalograms were obtained with conventional scalp disk electrodes bilaterally at frontal temporal, parietal and occipital locations Two sets of computer analyses were performed The first consisted of transforming the data from the time domain to the frequency domain Fourier Transformation The spectral measurements were input to a Linear Stepwise Discriminant Analysis which acts as a feature selector Analyses revealed that the most consistent difference between the disabled readers and the normals was the degree of shared electrical activity between symmetrical locations in the two hemispheres the absence of a well-developed narrow-band peak in the alpha band in the dyslexics and a narrow band alpha peak like that in normals in those dyslexics who had benefitted from remedial programs GRA

N75-28712# Utah Univ Salt Lake City Human Resources Inst
MECHANISMS FOR AIDING WORKER ADJUSTMENT TO TECHNOLOGICAL CHANGE CONCEPT, REVIEW OF THE LITERATURE, ABSTRACTS VOLUME 2 KEY WORK INDEX AND ABSTRACTS Final Report
Aug 1974 444 p refs
(Grant NSF DA-39438)
(PB-241019/9, NSF/RDA-73/16/3) Avail NTIS HC $11 25 CSCL 05I

The volume is an annotated bibliography covering the areas of worker adjustment to technological change The key words and articles are grouped into four main areas scope level, and content, private adjustment mechanisms public adjustment mechanisms and methodology The literature coverage extends from 1973 back to 1962 GRA

N75-28713 North Carolina State Univ, Raleigh
INVESTIGATIONS OF ROLL AND PITCH IN OFF-ROAD VEHICLES INCLUDING ACTIVE SEAT SUSPENSION Ph D Thesis
Roy Edward Young 1972 156 p
Avail Univ Microfilms Order No 75-15911

The roll and pitch vibrations of off-road vehicles was studied Two angular accelerometers were orthogonally mounted at the seat-chassis interface of a pneumatic-tired tractor The tractor was operated at 2 6 mph over a test track containing full sine, 6 inch high rectangular and 1 6 inch high rectangular obstacles Spectrogram analysis of the accelerometer outputs showed that roll acceleration levels were significantly greater than pitch acceleration levels Peak acceleration levels occurred around 1 1 Hz in roll and 4 5 Hz in pitch Above 5 Hz, both roll and

pitch acceleration levels subsided A computer model of roll and pitch was developed which is adaptable to the physical dimensions of any off-road vehicle An active rotational seat suspension system was constructed The system consists of an angular displacement transducer utilized as the command source for an electrohydraulic feedback control system designed to move the seat in antiphase with the input vibration Dissert Abstr

N75-28714# Southwest Research Inst, San Antonio, Tex
DEVELOPMENT OF CRITERIA FOR THE RECIRCULATION OF EXHAUST AIR Final Report
William J Astleford Jul 1975 270 p refs
(Contract CDC-99-74-96, SwRI Proj 02-4011)
Avail NTIS HC $8 50

Contaminant toxicity, the requirements for air monitoring and air cleaning equipment, reliability analyses of fail-safe systems, and theoretical modeling of system performance are described Analytical recirculation models are developed to predict the transient response of workroom concentration as a function of contaminant generation rate, room volume, general and recirculated air flows, and the air cleaner and local exhaust hood capture efficiencies The effect of air cleaner failure and bypass of exhaust air to the atmosphere are also modeled For individual titles,

N75-28715 Southwest Research Inst, San Antonio, Tex
DETERMINATION AND CATEGORIZATION OF RECIRCULATABLE CONTAMINANTS
In its Develop of Criteria for the Recirculation of Exhaust Air Jul 1975 p 4-19 refs

The Threshold Limit Value (TLV) Table for 1973 is discussed which contains in excess of 500 chemical substances that may be present in industrial workroom air Because recirculated exhaust air systems and the development of appropriate performance criteria are still in the neophyte stage a process or industry-oriented approach to contaminant selection was not indicated Therefore, each contaminant was considered as a separate entity Consequently, additive or synergistic effects resulting from recirculation of multiple contaminants were excluded from this study Author

N75-28716 Southwest Research Inst San Antonio, Tex
STATE-OF-THE-ART OF COMMERCIALLY AVAILABLE AIR CLEANING EQUIPMENT
In its Develop of Criteria for the Recirculation of Exhaust Air Jul 1975 p 20-29 refs

The two main objectives of this equipment assessment task are to (1) perform a technical review of the product specifications that are published by manufacturers of air cleaning devices The ultimate purpose of this review was to select a recommended air cleaner for each contaminant in Groups 1 through 4 and to construct a list of purchasers of cleaning devices for a review of user experience Insofar as was possible, the air cleaner recommendations that were performed under this task are presented (2) Conduct a review of user experience in order to gather performance failure rate and maintenance data on selected air cleaners for input to a reliability and fail-safe system analysis Author

N75-28717 Southwest Research Inst, San Antonio, Tex
RELIABILITY, MAINTENANCE, FAIL-SAFE, CONTROL AND SAMPLING PROVISIONS FOR RECIRCULATED EXHAUST AIR SYSTEMS
In its Develop of Criteria for the Recirculation of Exhaust Air Jul 1975 p 30-104 refs

Worker safety should be the dominant consideration in the design of a recirculated exhaust air system for industrial applications The design must, therefore be fail-safe in the sense that it minimizes the probability of excessive exposure to workroom contaminants caused by failure of a major system component or subsystem In this section two recirculation models are developed and each model is analyzed for system reliability The requirements for monitoring and automatic control systems are investigated Author

N75-28718 Southwest Research Inst, San Antonio, Tex
ANALYTICAL RECIRCULATION MODELS
In its Develop of Criteria for the Recirculation of Exhaust Air Jul 1975 p 105-129 refs

An analytical model is required in order to determine the ranges of system parameters that will maintain the workplace concentration below the TLV and to weigh various alternatives in selecting system components A model is developed which specifies the required recirculation flow rate or the allowable concentration in the recirculated air discharge in terms of the release rate of the contaminant, the efficiency of the air cleaning system the overall ventilation rate, and the TLV of the contaminant Author

N75-28719*# Texas Univ Health Science Center Houston School of Public Health
FOOD SAFETY Final Report
Stanley M Pier and Jane L Valentine [1975] 95 p refs
(Contract NAS9-11701)
(NASA-CR-141928) Avail NTIS HC $4 75 CSCL 06H

Illness induced by unsafe food is a problem of great public health significance This study relates exclusively to the occurrence of chemical agents which will result in food unsafe for human consumption since the matter of food safety is of paramount importance in the mission and operation of the manned spacecraft program of the National Aeronautics and Space Administration Author

N75-28720*# Life Systems, Inc Cleveland Ohio
ADVANCED WATER IODINATING SYSTEM Final Report, 3 May 1974 - 28 Feb 1975
R J Davenport, F H Schubert and R A Wynveen Feb 1975 244 p refs
(Contract NAS9-13931)
(NASA-CR-141937 LSI-ER-218-3) Avail NTIS HC $7 50 CSCL 06I

Potable water stores aboard manned spacecraft must remain sterile Suitable sterilization techniques are needed to prevent microbial growth The development of an advanced water iodinating system for possible application to the shuttle orbiter and other advanced spacecraft, is considered The AWIS provides a means of automatically dispensing iodine and controlling iodination levels in potable water stores In a recirculation mode test, simulating application of the AWIS to a water management system of a long term six man capacity space mission, noniodinated feed water flowing at 32 2 cu cm min was iodinated to 5 + or - ppm concentrations after it was mixed with previously iodinated water recirculating through a potable water storage tank Also, the AWIS was used to successfully demonstrate its capability to maintain potable water at a desired I2 concentration level while circulating through the water storage tank, but without the addition of noniodinated water Author

N75-28721*# Lockheed Missiles and Space Co Sunnyvale Calif Bioengineering Organization
DESIGN, FABRICATION AND TESTING OF A WET OXIDATION WASTE PROCESSING SYSTEM Final Report
15 May 1975 116 p refs
(Contract NAS1-11748)
(NASA-CR-141916) Avail NTIS HC $5 25 CSCL 06K

The wet oxidation of sewage sludge during space flight was studied for water and gas recovery and the elimination of overboard venting The components of the system are described Slurry and oxygen supply modules were fabricated and tested Recommendations for redesign of the equipment are included F O S

N75-28722*# National Aeronautics and Space Administration Lyndon B Johnson Space Center Houston Tex
SKYLAB MOBILE LABORATORY
Gary R Primeaux and Maurice A LaRue (Martin Marietta Corp) Washington Jul 1975 61 p
(NASA-TN-D-8028 JSC-S-429) Avail NTIS HC $4 25 CSCL 22B

The Skylab mobile laboratory was designed to provide the capability to obtain necessary data on the Skylab crewmen 30 days before lift-off, within 1 hour after recovery and until preflight physiological baselines were reattained The mobile laboratory complex consisted of six laboratories that supported cardiovascular metabolic, nutrition and endocrinology operational medicine, blood and microbiology experiments, a utility package, and two shipping containers The objectives and equipment requirements of the Skylab mobile laboratory and the data acquisition systems are discussed along with processes such as permanently mounting equipment in the individual laboratories and methods of testing and transporting the units The operational performance in terms of amounts of data collected and the concept of mobile laboratories for medical and scientific experiments are evaluated The Skylab mobile laboratory succeeded in facilitating the data collection and sample preservation associated with the three Skylab manned flights Author

N75-28723# Naval Underwater Systems Center New London Conn

VISUAL SAMPLING ON A SIMULATED DIMUS-TYPE DISPLAY

Richard L Mason 27 Jan 1975 56 p refs

(AD-A005318, NUSC-TR-4861) Avail NTIS CSCL 05/8

Experienced sonar operators were used to study the visual search on a simulated DIMUS display The electro-oculargram was used to estimate the location and amount of time spent in each eye fixation on the display made while the operators searched for targets The data obtained were analyzed to determine the eye movement parameters, the visual coverage of the display and the relation between operator attention to areas on the display and the display data in those areas It was found that the operator search of the display is not only nonuniform, but it is also incomplete The operator viewing time was not uniformly distributed across the display and, on most presentations some areas of the display were not even fixed Thus, the probability of target detection depends on the target location on the display GRA

N75-28724# Mine Safety Appliances Co, Pittsburgh Pa Research and Engineering Div

SHORT DURATION SELF-RESCUE BREATHING APPARATUS

E E Buban and R E Gray 1 Apr 1974 122 p refs

(Contract DI-BM-HO-220071)

(PB-240471, BM-OFR-6-75) Avail NTIS HC $5 25 CSCL 06G

A self contained breathing apparatus was developed to provide complete respiratory protection for a miner in an irrespirable atmosphere The apparatus has the desired features of comfort reliability maintainability, and quick-donning capability The apparatus is packaged in a moistureproof envelope and is protected in a shock-absorbing, fiberglass resin-carrying case The apparatus is a small light-weight, one-time-use device that can be readily worn on a miner's belt requires no maintenance and is designed to have a shelf life of five years and a carrying life of three years It is deployed to the use position in a period of 15 to 30 seconds Man tests conducted in-house established that this unit meets all performance requirements listed in the Code of Federal Regulations GRA

N75-28725# Lockheed Missiles and Space Co, Sunnyvale, Calif

ONE-HOUR SELF-RESCUE BREATHING APPARATUS Technical Report, Jul 1972 - Sep 1974

Oct 1974 122 p refs

(Contract DI-BM-HO-220040)

(PB-240420/0, LMSC-D401004, BuMines-OFR-8-75) Avail NTIS HC $5 25 CSCL 06G

A one-hour, 4 5-pound, self-contained emergency breathing apparatus tested and approved by the National Institute for Occupational Safety and Health and the Mining Enforcement and Safety Administration for underground coal mines is described The unit is used by miners to replace the existing self rescuers It provides a minimum of one hour of breathable atmosphere during escape from a mine with contaminated or oxygen-deficient atmosphere Contract requirements and accomplishments of the development program are summarized along with a description of the apparatus (PBA), including the functions of the components GRA

N75-28726# Defense Documentation Center Alexandria, Va

PROTECTIVE CLOTHING Report Bibliography, Jan 1953 - Jun 1974

Jan 1975 329 p refs

(AD-A005300, DDC-TAS-74-38) Avail NTIS CSCL 06/17

The bibliography contains unclassified and unlimited citations Discussed are protective clothing such as fire protective clothing, flight clothing gasproof clothing, underwater clothing, pressure suits, and exposure suits It also includes pertinent information on stress physiological psychological and biological aspects of human performance in the use of protective clothing in actual test GRA

N75-28727# Army Chemical Center Edgewood Md

THERMAL PERFORMANCE OF PERMEABLE VERSUS IMPERMEABLE HOODS WORN BY MEN IN CB ENSEMBLE WORKING IN A TROPICAL ENVIRONMENT

Arthur T Johnson Jan 1975 31 p

(DA Proj 1W7-62710-A-095)

(AD-A005613, ED-TR-74081) Avail NTIS CSCL 06/17

A hood fabricated from twill cloth with air permeability of 175 cu ft/sq ft/min of 0 5 inch of water was evaluated by comparison with the standard impermeable hood and no hooded condition Men walked for 6 5 miles at an average rate of 2 5 mph in a hot environment with average wet bulb globe temperature between 81 and 87 F Twelve replications were performed The permeable hood was found to be statistically different from either impermeable hood or no hood Very little operational advantage can be gained however by depending solely on the impermeable hood to remove excess heat Author

N75-28728# Army Chemical Center, Edgewood Md

A METHOD FOR SOFT BODY ARMOR EVALUATION MEDICAL ASSESSMENT Technical Report, Jul 1973 - Jun 1974

Michael A Goldfarb, Terrence F Ciurej, Michael A Weinstein, and Le Roy W Metker Jan 1975 32 p refs

(AD-A005575 EB-TR-74073) Avail NTIS CSCL 06/17

As part of a project to evaluate the protection afforded by soft body armor using goats, the authors tested the validity of certain assumptions concerning the extrapolation of damage to the goat to damage to a human Much of this report concerns the goat-human correlation The consequences of an impact of a 38 caliber bullet traveling at a velocity of 800 feet per second (fps) when the area of impact was covered with a 7-ply Kevlar protective garment were studied in the goat The blunt trauma experienced was correlated with expected damage if a human had been the target It was concluded that without the garment, the mortality after a random hit with a 38 caliber bullet is between 6 9% to 25 4% If the garment is worn, the mortality is decreased to 1% to 5% The chance of surgery being needed when the armor is not worn is 81 5% to 100% and when the armor is worn is 7% to 10% GRA

N75-28729*# Kanner (Leo) Associates, Redwood City, Calif

CHEMICAL CONTROLS FOR STERILIZATION IN AUTOCLAVES

Astrid O Rex and Hugo V Zunino Washington NASA Jul 1975 11 p refs Transl into ENGLISH from Rev Med Chile (Chile), 1972 p 1087-1090

(NASA-TT-F-16478) Avail NTIS HC $3 25 CSCL 06M

The relative resistance to heat applied in an autoclave of three bacteria Bacillus subtilis, Staphylococcus aureus and Salmonella senftenberg, was studied The viability of these bacteria following exposure to moist heat at different levels of heat and exposure time was studied in conjunction with the change in color of several types of chemical sterilization controls under the same conditions The conclusions regarding the ratio of complete bacteria destruction to change in the chemical controls are the following (1) there was a definite correlation between bacteria survival and change in the chemical controls, (2) there

was a wide margin between chemical control change and survival of some bacteria, (3) there was evident survival where a very light brown color occurred, but none of the bacteria studied survived when the controls attained a dark brown color Author

N75-29719*# Kanner (Leo) Associates, Redwood City, Calif
CHEMICAL CONTROLS FOR DRY HEAT STERILIZATION
Astrid O Rex and Hugo V Zunino Washington NASA Jul 1975 8 p refs Transl into ENGLISH from Rev Med Chile (Chile), v 102, no 1, 1974 p 26-28
(NASA-TT-F-16321) Avail NTIS HC $3 25 CSCL 06M

The correlation of the minimum requirements for change in color of various chemical dry heat sterilization controls and the minimum conditions for actual sterilization was studied The resistance of three microbial species (B subtilis, S senftenberg and S aureus) to dry heat was tested and compared with the changes produced in domestic and imported chemical controls The effect of temperatures ranging from 130 C to 180 C for periods ranging from 30 to 90 minutes was studied The resistance of B subtilis was much greater than that of the other species and some survival was observed at 160 C for 1 hour Complete color change occurred following exposure to 160 C for 1 hour or more, so that the margin of safety of the chemical dry heat sterilization controls is relatively limited Author

N75-29720*# Scientific Translation Service, Santa Barbara, Calif
SPACE FOOD PREPARATION AND PACKAGING A MENU FOR COSMONAUTS AND 'SPACE' BREAD
A Perkunov Washington NASA Jul 1975 7 p Transl into ENGLISH from Russian Newspapers 1974
(Contract NASw-2483)
(NASA-TT-F-16467) Avail NTIS HC $3 25 CSCL 06H

Food preparation for space was described in conjunction with the Soyuz 14 - Salyut 3 flights Two foods developed - a tomato sauce Moldava and fruit bars - were taken on the current flight and apparently enjoyed by the cosmonauts The sauce was packaged in aluminum tubes with special clips for attachment, the bars were infrared dried, pressed, and packaged in plastic A discussion of space food preparation is included that describes bread and cottage cheese packaged in a digestable plastic wrap Author

N75-29721*# Kanner (Leo) Associates, Redwood City, Calif
CERTAIN CHARACTERISTIC FEATURES OF FLOWERING AND POLLINATION IN DUCKWEEDS (LEMNACEAE S GRAY)
I E Ivanova Washington NASA Aug 1975 21 p refs Transl into ENGLISH from Botan Zh (Leningrad), v 55, May 1970 p 649-659
(Contract NASw-2790)
(NASA-TT-F-16483) Avail NTIS HC $3 25 CSCL 06F

The species of the Lemnaceae subfamily differ from those of Wolffioideae by the presence of the spathe The membranous spathe of duckweeds is the phyllocladium reduced in size with reproductive organs on the dorsal surface (as in Wolffioideae) The data on the chemical analyses of water under flowering specimens are important for the ecology of flowering duckweeds Duckweeds are capable of pollination by insects, by wind and also of self-pollinating in cases of failure in cross pollination Author

N75-29722# Advisory Group for Aerospace Research and Development, Paris (France)
CURRENT STATUS IN AEROSPACE MEDICINE
Walton L. Jones, ed (NASA, Washington) May 1975 75 p refs Presented at the Aerospace Med Panel Meeting, Naples, 16-20 Sep 1974
(AGARD-CP-154) Avail NTIS

Papers are presented which discuss the following topics habitability factors in the design of future space systems, ejection problems and health and career management issues in the military services

N75-29723 United Aircraft Corp, Washington, D C Hamilton Standard Div
SPACE LIFE SUPPORT TECHNOLOGY FOR A MODULAR INTEGRATED UTILITY SYSTEM
Edwin J Wulff *In* AGARD Current Status in Aerospace Med May 1975 8 p refs

Space station environmental control systems developed to provide water purification, waste disposal, heating, cooling, contaminant control, and power generation are considered for commercial application An earth oriented program, Modular Integrated Utility System (MIUS), designed to recycle energy through the integration of utility services in a single plant that provides solid and liquid waste treatment, water purification, domestic hot water, air conditioning and space heating, and electricity is described The modularity of the MIUS concept is adaptable to military and disaster-relief applications and makes possible the desired technology transfer from the space program to the utility needs of the less developed nations Author

N75-29724 European Space Technology Center, Noordwijk (Netherlands)
HABITABILITY DESIGN IN EUROPE'S SPACELAB A STATUS REPORT
A B Thompson *In* AGARD Current Status in Aerospace Med May 1975 7 p refs

The habitability data obtained on previous manned space missions, particularly Skylab are reviewed in terms of the Spacelab module design both interior environment and laboratory architecture Unresolved habitability problems concerning the lack of up-to-date anthropometric data on males and females and potential motion sickness during the first days of weightlessness are considered J M S

N75-29725* National Aeronautics and Space Administration, Washington, D C
A SUMMARY OF SKYLAB FINDINGS OF INTEREST TO LIFE SCIENTISTS
Walton L Jones *In* AGARD Current Status in Aerospace Med May 1975 16 p refs

The medical findings of the Skylab mission are discussed along with the habitability, man machine factors, and the reliability of Skylab life support systems Author

N75-29726 Italian Air Force Aerospace Medical Center, Rome
PRELIMINARY RESEARCH ON BODY DISPLACEMENT DURING LUNAR WALKING
A Scano and A Castellani *In* AGARD Current Status in Aerospace Med May 1975 6 p refs

A 16 mm film taken during Scott's and Irwin's walk on the surface of the moon is employed to analyze body displacement during lunar walking The technique and results are described J M S

N75-29727 School of Aerospace Medicine, Brooks AFB, Tex Biodynamics Branch
THE PLUS Gz PROTECTIVE METHODS FOR USE IN ADVANCED FIGHTER-ATTACK AIRCRAFT
Robert W Krutz, Jr Sidney D Leverett, Jr, Russell R Burton, and John W Burns *In* AGARD Current Status in Aerospace Med May 1975 7 p refs

Methods to enhance acceleration tolerance and protection are reviewed Emphasis is placed on the following anti-G devices or techniques (1) the L-1 straining maneuver, (2) positive pressure breathing, (3) preacceleration inflation, (4) uniform pressurization of the lower body, and (5) a tilt-back seat J M S

N75-29728 School of Aerospace Medicine, Brooks AFB, Tex Clinical Sciences Div
THE AIRCREWMAN AT INCREASED RISK OF ISCHEMIC VASCULAR DISEASE
Malcolm C Lancaster *In* AGARD Current Status in Aerospace Med May 1975 5 p refs

A combined risk approach is proposed to delay or prevent the serious consequences of ischemic vascular disease (IVD)

The approach consists of a set of risk factors that predict individual susceptibility to IVD and a set of proven interventions directed at specific risk factors J M S

N75-29729 Defense Dept , Washington, D C Office of the Assistant Secretary of Defense for Health and Environment
A STUDY ON MEDICAL OFFICER CAREER MANAGEMENT AND RETENTION IN THE USA ARMED FORCES
John E Murphy *In* AGARD Current Status in Aerospace Med May 1975 13 p refs

Factors which influence career management and retention of medical officers in the Armed Forces are identified Various mathematical techniques were used to identify the individual goals of medical officers and the relationship of these goals to selected aspects of a military career Results include information on the perceptions and expectations of young medical officers toward a career in the Armed Forces Specific potential policy changes are evaluated in terms of improved career management and increased retention of medical officer Author

N75-29730# Auburn Univ , Ala Cooperative Wildlife Research Unit
THE EFFECT OF SONIC BOOM ON THE NESTING AND BROOD REARING BEHAVIOR OF THE EASTERN WILD TURKEY Final Report
Thomas E Lynch and Dan W Speake Jan 1975 39 p refs (Contract DOT-FA72WAI-238)
(AD-A005986, ARD-550, FAA-RD-75-2) Avail NTIS HC $11 50 CSCL 06/3

Twenty wild turkey hens were captured and equipped with 164 MHz transmitters The nest sites of eight hens were successfully located by telemetric triangulation and four of these were subjected to both real and simulated sonic booms Hens with young were also located but were subjected to simulated sonic booms only Results indicate that sonic booms do not initiate any abnormal behavior in wild turkeys or decrease their productivity Author

N75-29731*# Transemantics, Inc , Washington, D C
EFFECT OF SECTIONING OF THE SPINAL CORD IN THE MIDLUMBAR PORTION ON HEAT EXCHANGE AND DEVELOPMENT OF FEVER IN RABBITS
A I Anisimov Washington NASA Aug 1974 7 p refs Transl into ENGLISH from Patol Fiziol Eksp Ter (USSR), v 13, Jan -Feb 1969 p 76-78
(Contract NASw-2792)
(NASA-TT-F-16496) Avail NTIS HC $3 25 CSCL 06C

Shifts in total heat exchange following a spinal section are discussed which permit the retention of homiothermy, the role of parts of the body with impaired and preserved innervation, and the degree of participation of physical and chemical heat regulation in the development of fever under these conditions The experiments were conducted on 12 male rabbits and the spinal section was performed at the L2-L4 level It was found that the heat loss and the production of heat in the body increased The increase in heat emission from parts deprived of normal innervation was offset by an increase in thermogenesis and a decrease in the heat emission from ear skin Fever in the test rabbits did not differ appreciably from that of normal ones Author

N75-29732*# Transemantics, Inc , Washington, D C
RESISTANCE OF NADSONIELLA NIGRA VAR HESUELICA TO THE ACTION OF A HIGH VACUUM
A A Imshenetskiy, S V Lysenko, S P Lyakh, and V F Udovenko Washington NASA Aug 1975 7 p refs Transl into ENGLISH from Izv Akad Nauk SSSR, Ser Biol (USSR), Jan - Feb 1974 p 125-127
(Contract NASw-2792)
(NASA-TT-F-16503) Avail NTIS HC $3 25 CSCL 06M

Data are given on the resistance of Nadsoniella nigra var hesuelica to a high vacuum (10 to the minus 9th power Torr) at low temperatures The oxidative function and activity of iron porphyrin proteins are studied in the surviving cells A high resistance of this culture to a high vacuum is demonstrated, this being consistent with its low sensitivity to the action of several other factors Author

N75-29733# Rutgers Univ , New Brunswick, N J
BIODEGRADATION OF SOME POLYNUCLEAR AROMATIC PETROLEUM COMPONENTS BY MARINE BACTERIA Technical Report, 1 Jan. - 31 Dec. 1974
D Dean-Raymond and R Bartha 25 Feb 1975 21 p refs (Contract N00014-67-A-0115-0005, NR Proj 137-843)
(AD-A006346, TR-N-5) Avail NTIS CSCL 06/13

The metabolism of polynuclear aromatic hydrocarbons was studied using gas chromatographic, thin-layer chromatographic, infrared and mass spectrometric techniques Of six bacterial strains isolated from oil polluted estuarine water, all grew on naphthalene, 2-methylnaphthalene and 2-ethylnaphthalene as sole sources of carbon and energy Several other alkyl naphthalenes were metabolized by various strains Phenanthrene and anthracene were metabolized by three out of six organisms Only one naphthalene-grown strain was able to metabolize other polyaromatic compounds, including acenaphthylene, biphenyl, fluorene and tetralin The specificity of salicylate hydroxylase governs the utilization of several naphthalene derivatives while inability to oxidize naphthoic acids prevents growth on dimethylnaphthalenes GRA

N75-29734# Rosenstiel School of Marine and Atmospheric Sciences, Miami, Fla
IN-SITU SEPARATOR
Shale Niskin Feb 1975 12 p refs
(Contract N00014-67-A-0201-0013)
(AD-A006274, UM-RSMAS-7) Avail NTIS CSCL 06/2

The device was developed to study the primary productivity of small organisms The sampler is messenger actuated in two discrete steps The first step actuates the sampler, filling its chamber with water and injecting the tracer solution The sample is then allowed to incubate The second messenger actuation causes a discharge of compressed gas to enter the chamber via a manifold arrangement, forcing the contained water out through a millipore filter Both entry and exit of water are controlled by a dual-valve arrangement The sampler is recovered empty of its contents with the millipore filter ready for laboratory analysis GRA

N75-29736# Advisory Group for Aerospace Research and Development, Paris (France)
TREADMILL EXERCISE TESTING AT THE USAF SCHOOL OF AEROSPACE MEDICINE PHYSIOLOGICAL RESPONSES IN AIRCREWMEN AND THE DETECTION OF LATENT CORONARY ARTERY DISEASE
V F Froelicher (School of Aerospace Med), F Yanowitz (School of Aerospace Med) A J Thompson (School of Aerospace Med) and M C Lancaster (School of Aerospace Med) May 1975 65 p refs
(AGARD-AG-210 AGARDograph-210) Avail NTIS HC $4 25

Despite the selective nature of the USAF flying population, coronary heart disease is the leading disease cause of death disability and removal from flying duties The purpose is to present the experience of the United States Air Force School of Aerospace Medicine (USAFSAM) in the use of treadmill exercise for evaluating asymptomatic aircrewmen The monograph consists of separate studies involving aspects of treadmill testing experience at the USAFSAM including descriptions of techniques

N75-29737 Advisory Group for Aerospace Research and Development, Paris (France)
PHYSIOLOGICAL PARAMETERS OF EXERCISE PERFORMANCE
In its Treadmill Exercise Testing at the USAF School of Aerospace Med May 1975 p 1-14

When technology became available to collect and analyze expired air, the measurement of maximal oxygen consumption (VO2 max) was considered advantageous in evaluating functional capacity Tests were specifically designed to measure this physiological parameter Maximal aerobic working capacity is defined as the work level at which oxygen consumed fails to

increase linearly with further increases in workload and the oxygen consumption at this point is called VO2 max A study was designed to compare VO2 max and other physiological parameters measured during three standard protocols and to evaluate the reproducibility of each Author

N75-29738 Advisory Group for Aerospace Research and Development, Paris (France)
ELECTROCARDIOGRAPHIC ASPECTS OF EXERCISE TESTING
In its Treadmill Exercise Testing at the USAF School of Aerospace Med May 1975 p 14-60 refs

With additional experience and reevaluation of the original criteria, emphasis was placed on the importance of ST segment depression as the primary sign of myocardial ischemia A table summarizes the studies screening asymptomatic men using the double Master s test or a test with a comparable workload These studies included follow-up data and it is apparent that postexercise ST segment depression identified a high risk group of men The epidemiological terms used to describe the performance of screening tests are defined Author

N75-29739*# Scientific Translation Service Santa Barbara Calif
THE PROPHYLACTIC EFFECT OF HEADCOOLING ON COAL MINER'S CRAMPS 1 ELECTROENCEPHALOGRAPHIC OBSERVATION ON RABBITS DURING HEAD-COOLING UNDER THE HOT AND HUMID ENVIRONMENT
Tsuneo Shiratori Kazuo Sasaki Kyoji Sugawara, Takashi Iwamatsu, and Shun Kuroda Washington NASA Jul 1975 19 p refs Transl into ENGLISH from Tohoku Ishi, (Japan) v 66, no 1 1963 p 258-265
(Contract NASw-2483)
(NASA-TT-F-16448) Avail NTIS HC $3 25 CSCL 06P

An attempt was made in rabbit experiments to determine the effect of cooling the heads of subjects exposed to hot humid conditions, such as exist in Japanese mines Electroencephalograms confirmed the positive effect of head cooling using water and ice packs Author

N75-29740*# Texas Univ , Houston
STUDY TO DEFINE AND VERIFY THE PERSONAL ORAL HYGIENE REQUIREMENTS FOR EXTENDED MANNED SPACE FLIGHT ORAL PHYSIOLOGY AND MICROBIOLOGY IN SKYLAB MANNED SPACE MISSIONS Annual Report, 1 Jul. 1974 - 30 Jun 1975
Lee R Brown 30 Jun 1975 12 p
(Contract NAS9-11118)
(NASA-CR-144361) Avail NTIS HC $3 25 CSCL 06I

Methods for metabolic fingerprinting of pathogenic oral bacteria were developed and the effects of skylab missions on salivary electrolyte levels were studied High resolution gas liquid chromatographic (GLC) and pyrolysis-GLC procedures were used to obtain metabolic profiles of closely related bacteria associated with dental caries and periodontal disease It was found that the GLC procedures provide a practical and reproducible means of obtaining metabolic markers for identifying closely related strains of these organisms Fractions of stimulated whole saliva samples from the prime and back-up crews of the three Skylab missions were used to measure salivary electrolyte concentrations All the electrolytes previously reported as having increased in urine and feces during the missions were assessed Sodium, potassium calcium, magnesium phosphorous and chloride were studied A decrease in sodium and an increase in magnesium were observed but the mineral imbalances attributable to the mission-related increases in urinary electrolytes were not detected Author

N75-29741*# Scientific Translation Service, Santa Barbara Calif
ON THE OTOLITHS AND THEIR ORIGIN
S Nishio Washington NASA Aug 1975 68 p refs Transl into ENGLISH from Arch Ohren Nasen- Kehlkopfheilk (West Germany), v 115, 1926 p 19-63
(Contract NASw-2483)
(NASA-TT-F-16470) Avail NTIS HC $4 25 CSCL 06P

The otoliths of the vertebrates have been known for a relatively long time They were naturally first discovered in the teleosts where they are the largest, most compact and relatively enduring They may well have been known for as long as sentient men have been observant in cutting up fish skulls But their relation with the labyrinth was first detected in 1789 by Scarpa who called them ear bones Only later were they detected in birds by Breschet, and in humans and mammals Author

N75-29742*# Scientific Translation Service Santa Barbara Calif
STUDIES ON THE OTOLITHS OF THE TELEOSTS
Cl Fritz Werner Washington NASA Aug 1975 126 p refs Transl into ENGLISH from Z Wiss Zoo (East Germany) v 131 1928 p 502-587
(Contract NASw-2483)
(NASA-TT-F-16471) Avail NTIS HC $5 75 CSCL 06P

The function, shapes, and purpose of the otolith in fishes were investigated in numerous species Differences in the macula, marginal epithelia marginal fibrosities, and otolith parts are very pronounced among species New hypotheses about the purpose of the otolith in fishes are presented The dynamics of the components is investigated Author

N75-29743*# Pennsylvania State Univ University Park
EFFECTS OF HYPNOTIC DRUGS ON PERFORMANCE BEFORE AND AFTER SLEEP Final Technical Report, 1 Jun 1971 - 28 Feb 1975
A Kales E O Bixler and J D Kales [1975] 46 p refs
(Grant NGR-39-009-204)
(NASA-CR-143311) Avail NTIS HC $3 75 CSCL 06O

The effects of various hypnotics on sleep stage parameters and on the parameters of effectiveness were evaluated along with the effects of several commonly used yet distinctly different hypnotics on daytime performance The effects on daytime performance of two nonhypnotics commonly used in the space program were also examined Author

N75-29744# Chemical Lab RVO-TNO Rijswijk (Netherlands)
A STRUCTURE ACTIVITY STUDY OF OXIMES AIMING AT PROPHYLAXIS AGAINST ORGANOPHOSPHATES
H P Benschop, L P A DeJong, H Kienhuis ed , J A J Vink, F Berends ed , D M W Elskamp, L A Kepner E Meeter, and R P L S Visser 1974 28 p refs Prepared jointly with Med Biol Lab RVO-TNO
(CL-1974-23 MBL-1974-37, TDCK-65733) Avail NTIS HC $3 75

Development of oximes and other anticholinesterases of high toxicity is investigated These oximes should be potent reactivators, have low toxicity and be excited and transformed slowly by the body Properties of synthesized oximes evaluated are reactivating potency in vitro toxicity in mice biological half life in the blood of rats and rabbits after intravenous injection, and prophylactic activity against Sarin in mice Penetration into the central nervous system of a number of the oximes was investigated using rats ESRO

N75-29745# National Physical Lab Teddington (England) Div *of Computer Science*
SOME PRELIMINARY EXPERIMENTS IN THE USE OF A PROGRAMMABLE VIDEOTAPE RECORDER AS AN AUTOMATED HISTORY-TAKING DEVICE IN A CHEST CLINIC
C R Evans, C G J Kinchin (Guys Hosp Med School), H C Price (Western Hosp , London), and P B Whittle Mar 1974 14 p refs
(NPL-Com-73) Avail NTIS HC $3 25

The videotape recorder (VTR) was used as a doctor simulator to register the answers to diagnosing questions of cardiopulmonary diseases patients The system consists of a control panel with yes no repeat and ? buttons operated by the patient, a logic box to control the VTR an ICT VR 321 and a video monitor The experimental procedure is described the interviews held after each of the 20 man machine diagnoses are summarized, and preliminary conclusions are drawn ESRO

N75-29746# School of Aerospace Medicine, Brooks AFB Tex
EVALUATION OF AN ACOUSTICAL X-Y DIGITIZER FOR USE IN BIOMEDICAL DATA REDUCTION TASKS Final Report, Nov 1973 - Jun 1974
Darwell E Stowe Robert A Balusek, and Douglas H Threatt Dec 1974 11 p refs
(AF Proj 6319)
(AD-A005293 SAM-TR-74-63) Avail NTIS CSCL 06/2

Air Force biomedical data are often obtained in hard copy, graphic, or pictorial form Manual data reduction is laborious and time consuming The work reported here was directed at the development of methods for utilizing a new principle (acoustic ranging) for retrieving (digitizing) X-Y coordinate values from strip charts graphs, X-ray photographs or drawings Included are the results of a statistical study designed to assess the resolution precision bias, and linearity of the system These results verify that the quality of this digitizing process is more than adequate for use on most biomedical applications encountered at the school GRA

N75-29747# Michigan Univ, Ann Arbor Highway Safety Research Inst
BASIC BIOMECHANICAL PROPERTIES OF THE HUMAN NECK RELATED TO LATERAL HYPERFLEXION INJURY Final Report, 1 Nov 1973 - 31 Dec 1974
Richard G Snyder Don B Chaffin Lawrence W Schneider David R Foust Bruce M Bowman Thomas A Abelnour and Janet K Baum 15 Apr 1975 311 p refs
(Contract DRDA-74-342-B1)
(PB-241246/8 UM-HSRI-BI-75-4) Avail NTIS HC $9 25 CSCL 06S

Properties of the human neck which may influence a person s susceptibility to whiplash injury during lateral impact have been studied in 96 normal subjects The data include measures of head neck and body anthropometry in standing and normal seated positions stretch reflex time of sternomastoid muscles head/neck response to low-level acceleration voluntary isometric muscle force in the lateral direction and three dimensional range of motion of the head and neck Data are presented in a format applicable for biomechanical modeling of the seated human occupant and have been used in the MVMA-2D model adjusted for side impact at 10 and 30 mph to determine the influence of the measured properties of reducing whiplash injury susceptibility GRA

N75-29748# Aerospace Medical Research Labs Wright-Patterson AFB, Ohio
THE EFFECT OF QUIET ON HEARING
Charles W Nixon and Mark R Stephenson Jan 1975 22 p
(AF Proj 7231)
(AD-A006395, AMRL-TR-74-99) Avail NTIS CSCL 05/10

The hearing of subjects participating in psychoacoustic experiments may be elevated (temporary hearing loss) due to environmental noises encountered prior to their arrival at the test site Hearing threshold levels of trained subjects were measured immediately upon arrival at the Laboratory and again following individual 1/2 1, and 2 hour periods in the quiet of an anechoic chamber Comparisons of prequiet and postquiet thresholds revealed a slight trend of 1 or 2 decibles toward improved hearing after quiet However, the changes in hearing thresholds were not statistically significant and were judged to be too small to be of practical significance GRA

N75-29749# Army Aeromedical Research Lab Fort Rucker, Ala
EVALUATION OF PROPOSED ELECTROPLATED HGU-4-/P FRAMES Final Report
Roger W Wiley, Frank S Pettyjohn, and David D Glick Feb 1975 15 p refs
(AD-A006121, USAARL-75-9) Avail NTIS CSCL 06/5

A gold electroplated frame has been recommended to replace the standard gold-filled aviator frame Since the proposed frame contains a nickel-silver based metal the frame was evaluated under field and laboratory conditions at the U S Army Aeromedical Research Laboratory Of the 18 subjects who wore the test frames for three months one subject, an aviator, developed a mild dermatitis along the frontal and supraorbital portion of the face Chemical analysis indicated free nickel in sufficient quantity to cause a reaction from nickel sensitive individuals This study has shown that some skin reaction can be expected from a small percentage of wearers if the gold electroplated frame replaces the gold-filled frame GRA

N75-29750# Air Force Inst of Tech, Wright-Patterson AFB, Ohio School of Systems and Logistics
A SIMULATION OF THE EMERGENCY CLINIC AND DEPARTMENT OF PRIMARY CARE AT THE WRIGHT-PATTERSON AFB MEDICAL CENTER M S Thesis
Theodore L Brown and Donald R Dyer Jan 1975 191 p refs
(AD-A006345, SLSR-17-75A) Avail NTIS CSCL 06/12

The thesis concerns the development of a computer simulation model of the Emergency Clinic and Department of Primary Care of the Wright-Patterson AFB Medical Center in search of a way to reduce patient waiting time The authors determined that by revising medical personnel work schedules and by implementing a telephone scheduling system for patients, waiting time could be reduced considerably GRA

N75-29751# Lovelace Foundation for Medical Education and Research, Albuquerque N Mex
EFFECTS OF 60 Co ON ELECTRICAL SELF-STIMULATION OF THE BRAIN AND BLOOD PRESSURE
Alfred Bruner 13 Dec 1974 27 p refs
(Contracts DASA01-70-C-0059 DNA001-74-C-0098, DNA Proj NWED-QAXM)
(AD-A006428 DNA-3463T) Avail NTIS CSCL 06/18

The effects of 1000 and 2000 rad Co60 on electrical self-stimulation of subcortical brain areas and blood pressure were investigated to determine whether radiation-induced performance decrement occurs in a like manner for a positively-rewarded behavioral task as it does for the more typically studied shock-avoidance task During the early postradiation minutes self-stimulation responses decreased or ceased and resumed shortly thereafter revealing a similar course of performance decrement as seen with shock-avoidance discrimination tasks Early postradiation hypotension with subsequent recovery parallel the performance decrement, reproducing the blood pressure-behavior correlations seen previously with shock reinforcement The blood pressure elevating influence of the brain stimulation observed prior to irradiation was diminished or absent during the deep hypotensive stage postradiation, but tended to return minutes later Author (GRA)

N75-29752# Payne, Inc Annapolis, Md
SOME STUDIES RELATING TO LIMB FLAILING AFTER AN EMERGENCY ESCAPE FROM AN AIRCRAFT Final Report, 30 Jun 1971 - 2 Mar 1973
P R Payne Dec 1974 146 p refs
(Contract F33615-71-C-1892 AF Proj 7231)
(AD-A005699 Working-Paper-101-16 AMRL-TR-73-24) Avail NTIS CSCL 06/19

When a crew member ejects in an open escape seat his limbs may become dislodged from the seat and forced to trail behind him Injury may result The study described in this report is concerned with discovering the basic mechanisms of flail injury and determining the loads which cause limb dislodgement Simple dynamic concepts and models are presented together with the results of wind tunnel measurements of body segment forces Tunnel tests were limited to the symmetrical case of zero pitch and yaw Wind tunnel measurements were also made of body segment forces in simulated Tractor Rocket Egress System body positions In all cases, live human subjects were used It is believed that flail injury can be prevented, and several solutions are suggested GRA

N75-29753# Southwest Research Inst San Antonio, Tex
RESEARCH ON BIOLOGICAL EFFECTS OF VLF BAND ELECTROMAGNETIC RADIATION Final Report, Jun 1973 - Apr 1974

James N Bollinger Rammon L Lawson, and Walter C Dolle Nov 1974 139 p
(Contract F41609-73-C-0035, AF Proj 7757)
(AD-A006388 SAM-TR-74-52) Avail NTIS CSCL 06/18

Mice exposure to very high field intensities of very low frequency electromagnetic radiation was studied for nonthermal deterimental biological effects Two field intensities were employed at a frequency of 25 kHz E = 15,000 V/m and H = 7 5 A/m for full power exposure and E = 10 600 V/m, H = 5 3 A/m for one-half-power exposure Exposure consisted of 1 hr per day 5 days a week, for a total of 50 hr the growth, reproduction, and metabolism studies An additional group of animals was exposed 10 100 hr for assessment of possible pathological changes associated with these fields The results indicated that the high intensity low frequency electromagnetic *radiation exposure of dams and neonates had no statistical* detectable effect on the growth reproductive ability and metabolism of the neonates or the growth of their subsequent offspring Author

N75-29754# School of Aerospace Medicine Brooks AFB, Tex
LITTER ENPLANING-DEPLANING DEVICE Final Report, Jul - Oct 1974
Achille A Gousie Jan 1975 6 p
(AF Proj 7996)
(AD-A006137 SAM-TR-75-1) Avail NTIS CSCL 06/12

The litter enplaning-deplaning device was designed to provide a safe means for enplaning-deplaning litter patients on multimission aircraft without removing other patients in the same litter tier Two prototypes were fabricated in-house One prototype proved impractical for use and was abandoned Upon successful completion of development test and evaluation of the second prototype more units were fabricated in-house and made available to Military Airlift Command for operational test and evaluation GRA

N75-29755# School of Aerospace Medicine Brooks AFB, Tex
MEASURED EFFECTS OF SQUARE WAVE MODULATED RF FIELDS (450 AND 3100 MHz) ON CARDIAC PACEMAKERS Final Report, Jan - Jun 1974
William D Hurt, John C Mitchell and Terry O Steiner Dec 1974 37 p refs
(AF Proj 7757)
(AD-A006389 SAM-TR-74-51) Avail NTIS CSCL 06/12

Tests were performed to measure the effect of pulsed 450 and 3100 MHz RF radiation on cardiac pacemakers All models were tested in both a free-field and a simulated-implant configuration and were continuously monitored during testing Most of the models exhibited some type of electromagnetic interference under some conditions of the tests, although five recent, different models were unaffected under all conditions of these tests GRA

N75-29756# Naval Aerospace Medical Research Lab , Pensacola, Fla
THE EFFECT OF EXTREMELY LOW FREQUENCY RADIATION ON HUMAN PERFORMANCE A PRELIMINARY STUDY Medical Research Progress Report
Richard S Gibson and William F Moroney Aug 1974 24 p refs
(MF51524015)
(AD-A005898, NAMRL-1195) Avail NTIS CSCL 06/18

Interest in the development of an extremely low frequency (ELF) communications system for naval use has resulted in a program to determine the effects of such fields on man This report represents part of pilot level effort to develop a set of tests and procedures for determining whether ELF fields have any measureable effects on human memory and psychomotor functions None of the tests exhibited significant performance decrements under the gross analytical conditions The Wilkinson Adding Task exhibited significant performance decrements during the second of two testing sessions while being exposed to the ELF radiation One of the Response Analysis Tester (RATER) conditions exhibited a significant improvement in performance One subject had a significantly bad session in which his performance declined on 6 out 7 measures, however, this performance appeared to be unrelated to other psychological or physiological data In view of the large number of statistical analyses performed on a limited amount of data the few significant performance decrements must be interpreted with extreme caution They identify techniques to be replicated in future research and nothing more Individual differences in test performance were large any effects due to the exposure to ELF magnetic fields were small consequently, special consideration should be given to the possibility of using an exposure-reexposure experimental design in any future experiments GRA

N75-29757*# Agnew Tech-Tran Woodland Hills, Calif
TWO MEN IN SPACE
Ya Golovanov Washington NASA Aug 1975 6 p Transl into ENGLISH from Komsolskaya Pravda (USSR), 4 Feb 1975 p 4 Sponsored by NASA
(NASA-TT-F-16493) Avail NTIS HC $3 25 CSCL 05E

The psychological effects of long term isolation in space are discussed in terms of preparation of cosmonauts for space flight and evaluation of space flight experiences J M S

N75-29758*# Agnew Tech-Tran, Woodland Hills Calif
VOICES IN ORBIT
V Kuznetsov and E Lapayev Washington NASA Aug 1975 5 p Transl into ENGLISH from Krasnaya Zvezda (USSR) 7 Jun 1975 p 3
(Contract NASw-2789)
(NASA-TT-F-16499) Avail NTIS HC $3 25 CSCL 05E

The use of voice analysis for monitoring the functional and emotional state of the cosmonauts is discussed Voice communications are carefully analyzed by medical specialists It is noted that the decrease in muscle tone due to weightlessness and other flight factors can be measured by changes in the basic vocal frequency e g during the Soyuz 17 flight when Gubarev and Grechko were heard immediately after waking, their voices were so distorted they were momentarily not recognized by flight control operators The effect of accelerations on voice communications is being studied using centrifuge tests Currently, research is being conducted on voice analysis by computer, using such speech elements as intensity, intonation, and phrase structure Author

N75-29759# Loughborough Univ of Technology (England) Dept of Transport Technology
BEHAVIOURAL OBSERVATIONS OF PASSENGERS BOARDING A SLOW SPEED CONVEYOR L3 ACCELERATOR PROJECT
N M Hawkins, J Atha, and N Ashford Nov 1974 87 p refs Sponsored by Sci Res Council
(TT-7411) Avail NTIS HC $4 75

Ergonomic aspects of passengers conveyor systems are dealt with A film was taken of passengers loading a slow speed travellator at Heathrow Airport, London Behavioral analysis of the film established a relationship between a passenger's boarding style and the likelihood of subsequent balance problems Nonparametric tests of statistical significance, summary table of chi-squared tests and boarding time distributions are presented in annexes Author (ESRO)

N75-29760# Institute for Perception RVO-TNO Soesterberg (Netherlands)
DETERMINISTIC MULTIPLE CUE LEARNING PART 1 EFFECTS OF CUE INTERCORRELATION AND PRESENTATION ORDER
C L Truijens and C A P G VanDerMast 1974 23 p refs Sponsored by Neth Organ for the Advan of Pure Res
(IZF-1974-20-Pt-1, TDCK-65519-Pt-1) Avail NTIS HC $3 25

Six groups of nine subjects learned the same rule there were two correlation conditions and three presentation order conditions Correlation and order of presentation were factorially combined Training blocks with knowledge of results (KR) were alternated with testblocks without KR The composition of the test blocks was identical for all conditions and the presentation order was random Results indicate that positive correlation between the cues had an adverse effect on achievement, especially on the knowledge of the rule It is suggested that there is an

interaction between the sign of the cue correlation on the one hand and parity vs disparity of sign of the weights in the rule to be learned on the other Author (ESRO)

N75-29761# Institute for Perception RVO-TNO, Soesterberg (Netherlands)
ON CONTEXT EFFECTS IN SHORT TERM RETENTION
A A Bunt 1974 22 p refs Sponsored by Neth Organ for the Advan of Pure Res
(IZF-1974-28, TDCK-65599) Avail NTIS HC $3 25

Context effects were examined by comparing the performance at short lists (constant context) with the performance at the same lists presented between a large number of longer lists (variable context) Output order instruction and rehearsal instruction were factorially combined The following results emerged (1) the size of the context effect with a free output procedure instruction depends upon the degree to which subjects are inclined to use different output procedures in both contexts, (2) rehearsal affects output order only with a free output order instruction (independently of context) and (3) with constant context the recency effect is relatively large, while with a fixed output procedure instructon this effect coincides with a relatively small primacy effect (with variable context the reverse effects occur) The results are discussed within the framework of a positional retrieval cue theory Author (ESRO)

N75-29762# Institute for Perception RVO-TNO, Soesterberg (Netherlands)
MISPERCEPTION OF EXPONENTIAL GROWTH PART 1 NUMERICAL STIMULI
W A Wagenaar (Pa State Univ Univ Park) 1974 19 p refs Sponsored by Fulbright-Hays program
(IZF-1974-29-Pt-1, TDCK-65673-Pt-1) Avail NTIS HC $3 25

Exponential growth in numerical series is grossly underestimated in an intuitive extrapolation task Subjects extrapolations are described by a model with two parameters, one for underestimation of the nonlinear growth, the other for linear compensation The size of the effect is considerable, it is not unusual that two thirds of the subjects produce estimates below 10% of the normative value The effect increases with the exponent of the stimulus series, and with addition of a constant to the stimulus series Author (ESRO)

N75-29763# Institute for Perception RVO-TNO, Soesterberg (Netherlands)
MISPERCEPTION OF EXPONENTIAL GROWTH PART 2 GRAPHICAL STIMULI
W A Wagenaar (Pa State Univ Univ Park) and S D Sagaria (Penna State Univ, Univ Park) 1974 13 p ref Sponsored by Fulbright-Hays program
(IZF-1974-30-Pt-2, TDCK-65699-Pt-2) Avail NTIS HC $3 25

Underestimation of exponential growth in an extrapolation task, demonstrated with numerical stimuli, occurs to the same extent with graphical presentation of the growth process The previously proposed model provides a good description of the data Neither special instructions on the nature of exponential growth nor daily experience with growth processes enhance the extrapolations Author (ESRO)

N75-29764# Illinois Univ, Savoy Aviation Research Lab
MANIPULATING THE NUMBER AND TYPE OF ADAPTIVE VARIABLES IN TRAINING
Daniel Gopher, Beverly H Williges, Robert C Williges, and Diane L Damos Oct 1974 12 p refs
(Contract F44620-70-C-0105, AF Proj 6813)
(AD-A006229, ARL-74-12/AFOSR-74-7 AFOSR-75-0302TR) Avail NTIS CSCL 05/9

To investigate the effectiveness of various types and numbers of adaptive variables, 48 subjects performed a two-dimensional pursuit tracking task for five three-minute training sessions In the factorial design resulting in eight experimental conditions, three variables (frequency of the forcing function, ratio of acceleration to rate control, and the amount of gain in the control stick) were either fixed or adaptive A transfer and retention task in which the tracking situation changed periodically was used to evaluate the ability of subjects to adjust to change Each adaptive variable in training was analyzed separately Results are discussed in terms of stimulus and response similarity, the optimum number of adaptive variables and the appropriateness of a changing task to evaluate adaptive training GRA

N75-29765# Illinois Univ, Savoy Aviation Research Lab
THE MEASUREMENT OF OPERATOR CAPACITY BY MANIPULATION OF DUAL TASK DEMANDS
Daniel Gopher and Robert A North Oct 1974 71 p refs
(Contract F44620-70-C-0105 AF Proj 9778)
(AD-A006352, ARL-74-21/AFOSR-74-15, AFOSR-75-0409TR) Avail NTIS CSCL 05/9

This research assessed the potential of a new methodological technique for measuring operator load and individual differences in basic attention capabilities In addition, a preliminary validation study was conducted to evaluate the new measures as predictors of success in flight training The performance testing system included a digit-processing, reaction-time task, and a one-dimensional tracking task Comparisons were made between separate and concurrent performance of these tasks with adaptive adjustment of task difficulty for each subject Concurrent performance was manipulated in several combinations of performance demands and task priorities GRA

N75-29766# Illinois Univ, Savoy Aviation Research Lab
MAN AS A PRECIOUS RESOURCE THE ENHANCEMENT OF HUMAN EFFECTIVENESS IN FLIGHT OPERATIONS
Stanley N Roscoe Oct 1974 13 p refs
(Contract F44620-70-C-0105, AF Proj 9778)
(AD-A006353, ARL-74-20/AFOSR-74-14, AFOSR-75-0410TR) Avail NTIS CSCL 05/9

The enhancement of human effectiveness in flight operations involves the complementary processes of behavioral engineering and the selection and training of personnel the former serves to reduce the need for the latter, the latter completes the job left undone by the former Behavioral engineering is discussed with reference to the intentional effort to design equipment, organize system elements, and develop operational procedures to maximize system performance while minimizing the need to select and train personnel Research provides objective scientific evidence upon which to base decisions concerning the design of aviation systems and procedures and the selection and training of personnel Specific research topics are reviewed GRA

N75-29767# Air Force Inst of Tech, Wright-Patterson AFB, Ohio School of Systems and Logistics
A STUDY TO DETERMINE THE ADEQUACY OF THE TOOLS AND EQUIPMENT USED BY AIR FORCE WOMEN IN THE CRAFT SKILLS M S Thesis
Philip J Bolalek and Arthur G Grumblatt, Jr Jan 1975 126 p refs
(AD-A006342, SLSR-14-75A) Avail NTIS CSCL 05/5

The tools and equipment now used in maintenance, electronics, and civil engineering, were designed to meet the needs of a totally male work force This study addresses the adequacy of the tools and equipment for the women who are now working in these specialties The method of approaching this potential problem was to obtain the opinions of the women working in these specialties through self-administered questionnaires If more than ten percent of the respondents in a specialty considered a tool or equipment item to be inadequate that item was considered inadequate for women in that specialty Twenty-four items were identified as inadequate six of these items were inadequate in more than one specialty This study also collected data on the age, height, weight, and hand length of the women working in these specialties In addition to the identification of inadequate tools and equipment for women, this study found that some of these items may also be inadequate for men Additionally, potential problems were discovered with the quality of tools used in these specialties' and with the suitability of women for these specialties GRA

N75-29768# URS/Matrix Co, Falls Church, Va
EVALUATING MAINTENANCE PERFORMANCE TEST

ADMINISTRATOR'S MANUAL AND TEXT SUBJECT'S INSTRUCTIONS FOR CRITERION REFERENCED JOB TASK PERFORMANCE TESTS FOR ELECTRONIC MAINTENANCE Final Report, 1 Jan 1969 - 16 Jul 1974
Edgar L Shriver, John F Hayes, and William R Hufhand Jun 1975 638 p
(Contracts F33615-69-C-1232, F33615-70-C-1695, AF Proj 1710)
(AD-A005785, AFHRL-TR-74-57-Vol-2-Pt-2) Avail NTIS CSCL 05/10

The purpose of this document is to furnish a complete copy of the Test Subject s Instructions and the Test Administrator's Handbook for a battery of criterion referenced Job Task Performance Tests (JTPT) for electronic maintenance Part I of Volume II of this series of documents, reports and describes the development and tryout of this battery of tests GRA

N75-29769# New Mexico State Univ , University Park Dept of Psychology
A REVIEW OF RECENT MODELS OF ATTENTION Interim Report
M Gregory Smith Oct 1974 46 p refs
(Contract F44620-71-C-0072)
(AD-A006155 NMSU-AFOSR-TR-74-3, AFOSR-75-0307TR) Avail NTIS CSCL 05/10

The problem of inputting diverse signals at high speeds to a trainee remains one of the major bottlenecks in the training of pilots Attention is the name of the human process--which selects from the signals presented those requiring immediate response, those which must be held in memory for later action, and those which must be integrated with each other and with prior information How the signal is encoded, the nature of usable 'encodable signal units short- and long-term memories, and the interaction of all of these with the arousal system are equally important This report reviews the present status of concepts of attention and their postulated interactions with some of these other processes As such it provides a background for research aimed at improving the training procedures employed in jet pilot training GRA

N75-29770# Hughes Aircraft Co , Culver City, Calif
METHODS OF HANDLING SEQUENCE EFFECTS IN HUMAN FACTORS ENGINEERING EXPERIMENTS Interim Report, Jul 1973 - Jul 1974
Charles W Simon Dec 1974 210 p refs
(Contract F44620-72-C-0086, AF Proj 6813)
(AD-A006240, HAC-P74-541, AFOSR-75-0319TR) Avail NTIS CSCL 05/5

A common procedure in human factors engineering experiments is to test the same subject sequentially on a series of different experimental conditions These within-subjects designs produce sequence effects that may be unwanted or of considerable interest depending on the object of the investigators In this report, the more common sequence effects are identified and a variety of procedures, experimental designs, and statistical techniques to minimize, adjust for, or isolate these effects are described Some methods of comparing the effectiveness of different treatment presentation orders and for optimizing training schedules are discussed GRA

N75-29771# School of Applied Aerospace Sciences, Sheppard AFB, Tex
TRAINING OF ENLISTED WOMEN AS JET AIRCRAFT MAINTENANCE SPECIALISTS Final Report
Thomas M Longridge, Jr 9 Aug 1974 28 p refs
(AD-A006434, Sheppard-PR-74-4) Avail NTIS CSCL 05/9

The study was conducted to obtain data concerning performance and attitude by sex on members in training in Course 3ABR43131C-1, Aircraft Maintenance Specialist, Jet Aircraft One and Two Engines Mandatory course prerequisites are normal color vision and either a minimum aptitude percentile of Mechanical 50 or Electronic 50 Because aircraft maintenance includes many job tasks of a general type not ordinarily performed by female personnel before the widespread lifting of assignment restrictions as to sex of member the career field offers an excellent framework in which to compare males and females with respect to relative success in a technical area GRA

N75-29772*# Joint Publications Research Service, Arlington, Va
DINNER FOR A COSMONAUT
Ya Tolstikov Washington NASA Jul 1975 4 p Transl into ENGLISH from Sots Industriya (USSR), 18 Jul 1974 p 4
(NASA-TT-F-16465) Avail NTIS HC $3 25 CSCL 06H

A visit to a laboratory engaged in developing and testing freeze dried foods for use in space is reported The general principles and advantages of freeze drying are discussed first followed by information on the difficulties which have been encountered and solved About one third of the article specifically deals with use of freeze dried foods in space On new long term space flights freeze dried foods will make up more than half the space diet The food packets are described, together with information on how a cosmonaut prepares meals from freeze dried foods Author

N75-29773*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex
CONCEPT DESIGN OF THE PAYLOAD HANDLING MANIPULATOR SYSTEM
Jun 1975 122 p
(NASA-TM-X-72447, JSC-09709) Avail NTIS HC $5 25 CSCL 05H

The design, requirements, and interface definition of a remote manipulator system developed to handle orbiter payloads are presented End effector design control system concepts, and man-machine engineering are considered along with crew station requirements and closed circuit television system performance requirements J M S

N75-29774*# National Aeronautics and Space Administration Langley Research Center Langley Station, Va
HUMAN COMFORT RESPONSE TO RANDOM MOTIONS WITH A DOMINANT VERTICAL MOTION
Ralph W Stone, Jr May 1975 89 p refs
(NASA-TM-X-72691) Avail NTIS HC $4 75 CSCL 05H

Subjective ride comfort response ratings were measured on the Langley Visual Motion Simulator with vertical acceleration inputs with various power spectra shapes and magnitudes The data obtained are presented Author

N75-29775*# Kanner (Leo) Associates, Redwood City, Calif
NEWEST METHODS OF AIR DISTRIBUTION IN CONDITIONING SYSTEMS ON NAVAL TRANSPORT VESSELS
T I Yankina Washington NASA Aug 1975 13 p Transl into ENGLISH from the book 'Vsesoyuznaya Konferentsiya po Elektrosnabzheniya i Konditsionirovaniya Vozdukha na Transporte Riga, Zinatne Press, 1965 p 217-225
(Contract NASw-2790)
(NASA-TT-F-16498) Avail NTIS HC $3 25 CSCL 06K

Air conditioning systems newly introduced in Soviet and foreign ships are described as to advantages and comfort conditions afforded Temperature differences between supply air and room air were used in rating the various conditioning schemes Author

N75-29776*# Kanner (Leo) Associates Annapolis Md
VIBRATION AS AN ARTIFICIALLY CREATED HUMAN FACTOR OF THE ENVIRONMENT
K V Frolov and B A Potemkin Washington NASA Jul 1975 57 p refs Transl into ENGLISH of the manuscript "Biomekhanika Tela Cheloveka pri Deystvii Vibratsiy' Moscow Acad of Sci USSR, 1975 p 1-50
(Contract NASw-2790)
(NASA-TT-F-16475) Avail NTIS HC $4 25 CSCL 05H

The characteristics of vibrations acting on man under various production conditions are described The physiological and mechanical reactions of the human body to vibration are analyzed Results are presented from experimental studies of the dynamic characteristics of the human body and the arms of an operator A significant change is demonstrated in the parameters of dynamic

models of biomechanical systems with a change in position or degree of muscular tension The unstable behavior of the dynamic characteristics of the human body under the long-term influence of vibration are analyzed and a mathematical model of the active changes in the mechanical parameters of the body by man is discussed Author

N75-29777*# Kanner (Leo) Associates Redwood City, Calif
STATUS AND PROSPECTS FOR THE DEVELOPMENT OF AIR CONDITIONING FOR NAVAL VESSELS
V M Shamshin Washington NASA Aug 1975 43 p Transl into ENGLISH from the book "Vsesoyuznaya Konferentsiya po Elektrosnabzheniya i Konditsionirovaniya Vozdukha na Transporte" Riga Zinatne Press, 1965 p 5-44
(Contract NASw-2790)
(NASA-TT-F-16457) Avail NTIS HC $3 75 CSCL 06K

The current state and prospects of air conditioning for ships are discussed Both comfort air conditioning for passengers and crew, and technical air conditioning for better preservation of bulk cargo and petroleum as well as hold interior rust reduction, are discussed Characteristics of some Soviet and foreign systems are presented Author

N75-29778*# Fairchild Republic Div, Farmingdale, N Y
SPACE SHUTTLE/FOOD SYSTEM STUDY VOLUME 1 TECHNICAL VOLUME, OVEN STUDY Final Report
24 May 1975 97 p
(Contract NAS9-13138)
(NASA-CR-144366) Avail NTIS HC $4 75 CSCL 06K

The baseline space shuttle galley was designed to utilize lightweight rehydratable foods, to be prepared for consumption by rehydration with chilled or hot water The impact is examined of an extension of food types to include thermostabilized food, at ambient temperature, and frozen foods on the baseline design of the shuttle galley Weight, volume, and power penalities associated with heating thermostabilized and frozen foods by means of a hot air convection heating system and a conduction heating system are determined along with the impact on crew/galley interface and meal preparation J M S

N75-29779*# Fairchild Republic Div Farmingdale, N Y
SPACE SHUTTLE/FOOD SYSTEM STUDY VOLUME 2 SUPPORTING APPENDICES, OVEN STUDY Final Report
24 May 1975 177 p
(Contract NAS9-13138)
(NASA-CR-144367) Avail NTIS HC $7 00 CSCL 06K

Calculations and data regarding the development of a galley oven for use in the space shuttle are presented Heat flow, heat transfer, and food heating characteristics are given for various oven designs A design approach to guarantee structural reliability is also presented, in which the oven closure, door, and basic mounting points are considered D M L

N75-29780*# Kanner (Leo) Associates Redwood City Calif
ROBOT MANIPULATORS
Ye P Popov Washington NASA Aug 1975 54 p refs Transl into ENGLISH from the book "Roboty-Manipulyatory' Moscow, Znaniye Press, 1974 64 p
(Contract NASw-2790)
(NASA-TT-F-16482) Avail NTIS HC $4 25 CSCL 05H

The general use of robot manipulators is explained and the basics of their design and operation are described for the average reader Several pages of the first chapter include a discussion on the use of robot manipulators in space Possibilities for fully and partially automatic robots, robot manipulator and information robots for space shuttles, space stations and planetary exploration are outlined The only example given of robots actually used in space is a mention of the Soviet Lunokhod, which is characterized as the initial stage of planetary robot development A short list of references is included Author

N75-29781# Royal Aircraft Establishment, Farnborough (England)
HEAD AND NECK MOBILITY OF PILOTS MEASURED AT THE EYE
M C Champion and W G A Port Dec 1974 40 p refs
(RAE-TR-74158, BR44792) Avail NTIS HC $3 75

Mobility was studied by measuring the movement envelope of nine selected pilots' eye positions as each subject cranes his head and neck up, down and from side to side During these movements the subjects looked forward at a target board through a sight aperture The subjects were strapped into an ejection seat instrumented to monitor harness tension and were clothed in standard RAF summer and winter aircrew equipment assemblies The effects of wearing a standard RAF Mark 2/3 flying helmet and differences between movement with summer and winter flying clothing were assessed Author (ESRO)

N75-29782# Royal Aircraft Establishment, Farnborough (England)
STATISTICS IN HUMAN ENGINEERING
K R Maslen Dec 1974 22 p refs
(RAE-TR-74166, BR44996) Avail NTIS HC $3 25

Elementary concepts (averages, distributions, and correlation) are considered as well as the more fundamental topics of experimental approach, and the statistical or practical significance of results A plea is made for more consideration on individual results and less reliance on averages and for more detailed reporting Author (ESRO)

N75-29783# Calspan Corp, Buffalo, N Y
PERFORMANCE EVALUATION OF NEW GENERATION 50TH PERCENTILE ANTHROPOMORPHIC TEST DEVICES VOLUME 1 TECHNICAL REPORT Final Report, Jun 1973 - Aug 1974
Daniel E Massing Mar 1975 240 p refs
(Contract DOT-HS-053-3-664)
(PB-240920/9, CALSPAN-ZS-5352-V-2-Vol-1, DOT-HS-801431) Avail NTIS HC $7 50 CSCL 06N

Anthropomorphic test dummies developed and designated as the GM-50X were experimentally evaluated to (1) determine the degree of conformance to specifications and (2) establish by sled testing in typical restraint and crash environments their potential for experimental repeatability A series of eleven static and dynamic component tests were performed to measure the GM-50X dummies in accordance with the purchase description The results indicate substantial nonconformance with the specified criteria GRA

N75-29784# Calspan Corp, Buffalo, N Y
PERFORMANCE EVALUATION OF NEW GENERATION 50TH PERCENTILE ANTHROPOMORPHIC TEST DEVICES. VOLUME 2· ACCELERATOR SLED TEST DATA Final Report, Jun. 1973 - Aug. 1974
Daniel E Massing, Kenneth N Naab, and Phyllis E Yates Mar 1975 569 p
(Contract DOT-HS-053-3-664)
(PB-241121/3, CALSPAN-ZS-5352-V-3-Vol-2) Avail NTIS HC $13 00 CSCL 13F

Sled test configurations were employed to evaluate the dynamic performance repeatability of the GM 50X dummy Type 2 belt, pre-inflated air bag, energy absorbing steering column, and Type 1 belt with simulated instrument panel test environments were utilized to measure the performance of two identically fabricated dummies The graphical results of a statistical analysis is presented In addition, graphical results of the energy absorbing steering column and simulated instrument panel tests of the GM 50X dummies are presented in raw form GRA

N75-29786# Bendix Corp, Cocoa Beach, Fla Launch Support Div
PROTECTIVE CLOTHING ASSESSMENT OF NEED, VOLUME 1 Final Report
W L Barnhart, C R Toney, and L A Nicodemus Aug 1974 213 p
(Contract HSM-99-73-75)
(PB-241167/6, NIOSH-TR-75-01-Vol-1) Avail NTIS HC $7 25 HC also available from NTIS $16 00/set of 2 reports as PB-241166-SET

The document contains recommendations to conduct research in the general area of industrial/occupational protective clothing aimed toward the development of criteria and performance standards for protective clothing in 27 Industrial/Occupational

areas This work is a valuable contribution to the identification of occupational safety research needs and will undergo immediate and careful analysis by appropriate Institute staff The recommendations contained in this report do not, however, reflect the Institute's final decisions concerning a priority rating method, the rating of protective clothing, or future research objectives Modifications in these areas will be made as necessary GRA

N75-29786# Bendix Corp , Cocoa Beach, Fla Launch Support Div

PROTECTIVE CLOTHING: ASSESSMENT OF NEED, VOLUME 2 Final Report

W L Barnhart, C R Toney, and L A Nicodemus Aug 1974 391 p refs

(Contract HSM-99-73-75)

(PB-241168/4, NIOSH-TR-75-01-Vol-2) Avail NTIS HC$10 25 HC also available from NTIS $16 00/set of 2 reports as PB-241166-SET

Surveys of 27 industrial areas for assessing research needs toward the development of standards for protective clothing are presented GRA

N75-29787# Kinergetics, Inc , Tarzana, Calif

IMPROVED MINE RESCUE BREATHING APPARATUS Final Report, Jul 1972 - Oct. 1974

W H Ryback 24 Oct 1974 46 p

(Contract DI-BM-HO-220045)

(PB-241105/6, BM-OFR-26-75) Avail NTIS HC $3 75 CSCL 06G

A self-contained cryogenic breathing apparatus developed for a four hour period of mine rescue work is described The breathing apparatus failed to receive prototype approval Further development is recommended to achieve a preproduction prototype GRA

N75-29788# Army Foreign Science and Technology Center, Charlottesville, Va

COMPARATIVE CHARACTERISTICS OF THE MAIN TYPES OF CLIMATIC CLOTHING OF VOSTOK STATION PERSONNEL

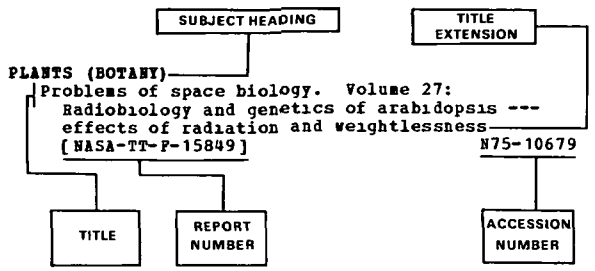
N I Makarov 7 May 1974 10 p refs Transl into ENGLISH Tr I Artich i Antarkt Nauchno-Issled Inst (USSR), v 299, 1971 p 231-235

(AD-A005876, FSTC-HT-23-0764-74) Avail NTIS CSCL 06/17

Research was carried out on various types of clothing used in the Antarctic The basic KAE suit made of camel hair was found to be the most suitable in extreme weather conditions The protective properties of clothing can be improved by increasing the amount of air under the clothing GRA

SUBJECT INDEX

Typical Subject Index Listing



The title is used to provide a description of the subject matter When the title is insufficiently descriptive of the document content a title extension is added separated from the title by three hyphens The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement If applicable a report number is also included as an aid in identifying the document

A

B

C

D

E

F

G

H

I

L

M

N

O

P

R

S

SPACE SHUTTLE ORBITERS

SPACE SHUTTLES

SPACE STATIONS

SPACE SUITS

SPACE TUGS

SPACECRAFT CABIN ATMOSPHERES

SPACECRAFT CABINS

SPACECRAFT CONSTRUCTION MATERIALS

SPACECRAFT CONTAMINATION

SPACECRAFT DESIGN

SPACECRAFT ENVIRONMENTS

SPACECRAFT MODULES

SPACECRAFT RADIATORS

SPACELAB

SPEECH

SPINAL CORD

SPLEEN

STANDARDS

STATISTICAL ANALYSIS

T

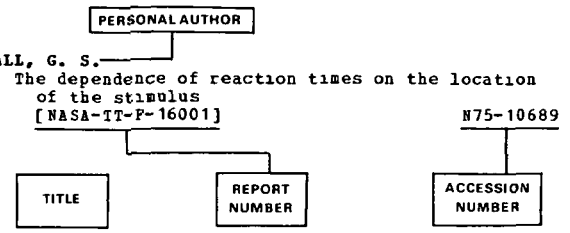
U

W

Y

PERSONAL AUTHOR INDEX

Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement If applicable a report number is also included as an aid in identifying the document

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

Y

Z

1. Report No.	2 Government Accession No.	3. Recipient's Catalog No.
NASA SP-7011(147)		

4. Title and Subtitle	5 Report Date
AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 147)	November 1975
	6 Performing Organization Code
7. Author(s)	8 Performing Organization Report No
	10. Work Unit No
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11. Contract or Grant No
	13 Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This bibliography lists 253 reports, articles, and other documents introduced into the NASA scientific and technical information system in October 1975.

17. Key Words (Suggested by Author(s))	18 Distribution Statement
Aerospace Medicine Bibliographies Biological Effects	Unclassified - Unlimited

19 Security Classif. (of this report)	20 Security Classif (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	88	$4.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to ten special libraries located in the organizations listed below Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention

CALIFORNIA
University of California, Berkeley
COLORADO
University of Colorado, Boulder
DISTRICT OF COLUMBIA
Library of Congress
GEORGIA
Georgia Institute of Technology, Atlanta
ILLINOIS
The John Crerar Library, Chicago
MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
MISSOURI
Linda Hall Library, Kansas City
NEW YORK
Columbia University, New York
PENNSYLVANIA
Carnegie Library of Pittsburgh
WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library
MISSOURI
Kansas City Public Library
St Louis Public Library
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library
OKLAHOMA
Oklahoma County Libraries, Oklahoma City
TENNESSEE
Memphis Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av Charles de Gaulle, 92-Neuilly-sur-Seine, France

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546